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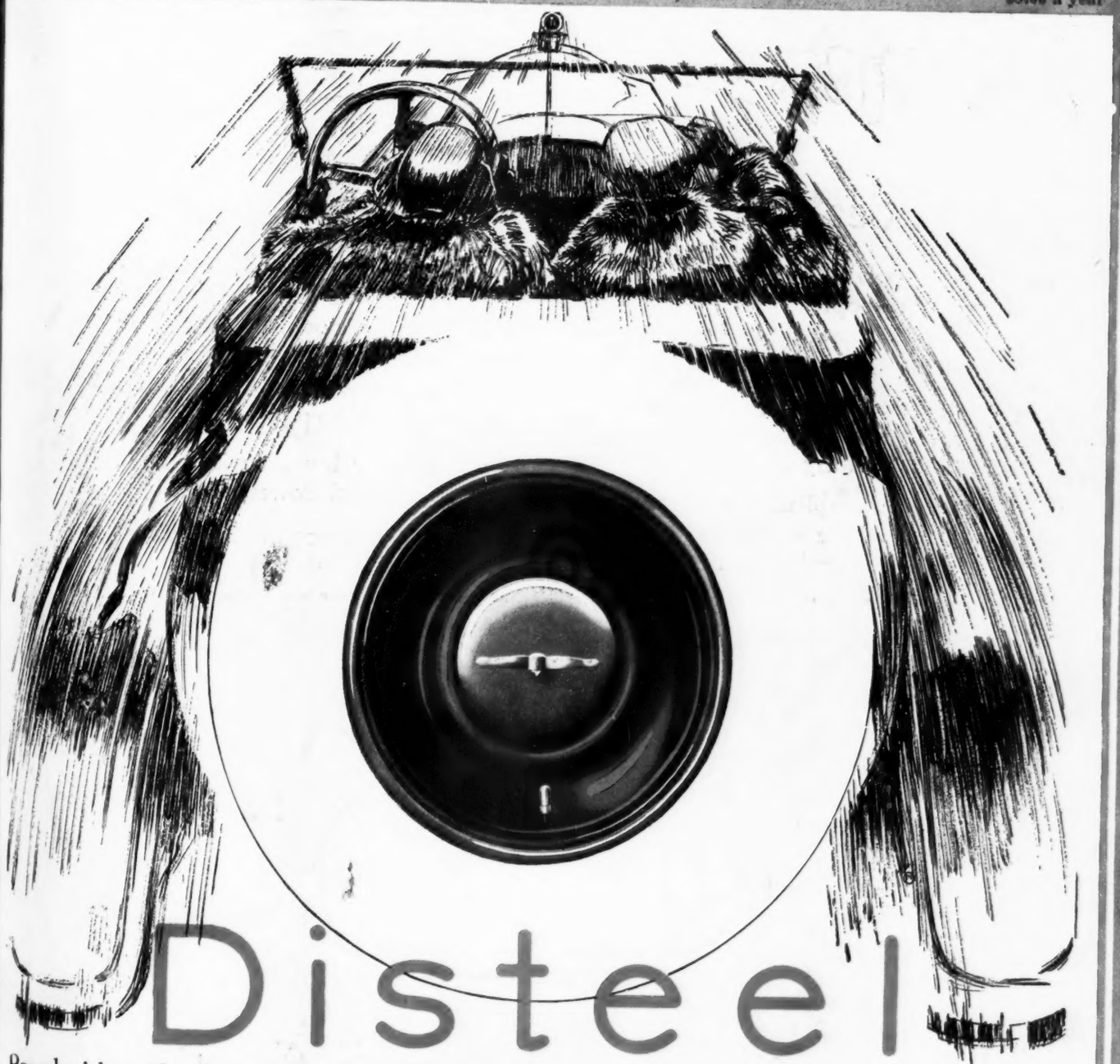

People identify the *make* of a car by its front end; the *type* of car by the Disteel spare wheel on the rear. The fifth Disteel wheel is just that much more reason why Motor Wheel supplies wheels to more car manufacturers than does anybody else.

MOTOR WHEEL CORPORATION, *WOOD WHEELS, STEEL WHEELS, STAMPINGS,* LANSING, MICHIGAN

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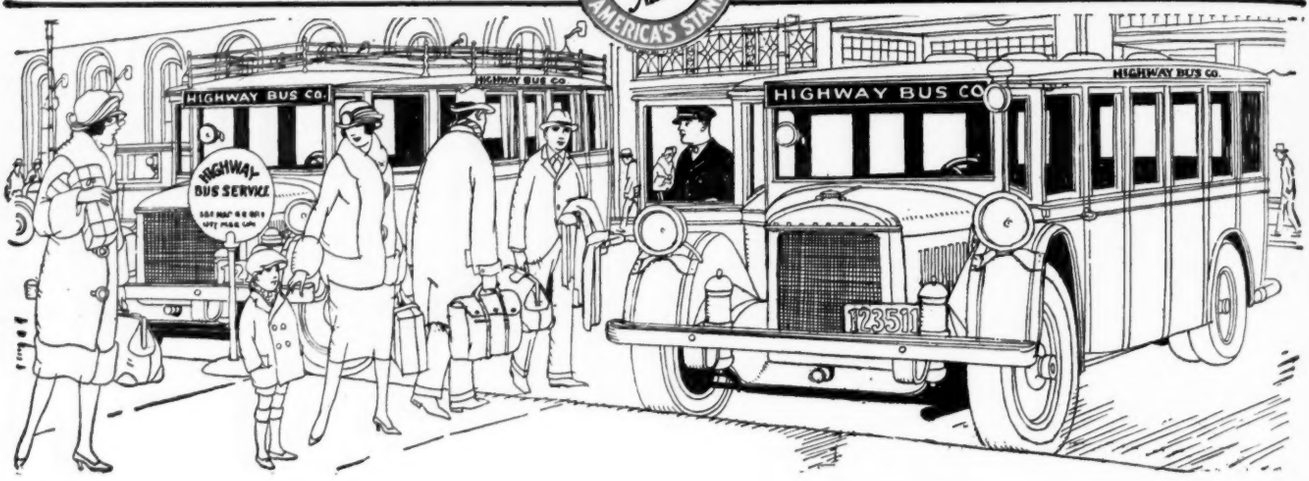

Red Seal Motors Bring Operating Profit

Bus operation is successful only when the operator can get a profit balance between costs and income.

To do this, transportation units must deliver the greatest possible passenger miles at the lowest possible operating cost.

In the accomplishment of profitable operation the motor is the pivotal part of bus equipment. On it success depends most.

Red Seal Continental Motors as bus power units leave nothing to chance. The bus owner knows that with such equipment he will get unfailing, economical performance, the surest road to a profit.

See that your bus chassis is built around Red Seal Power.

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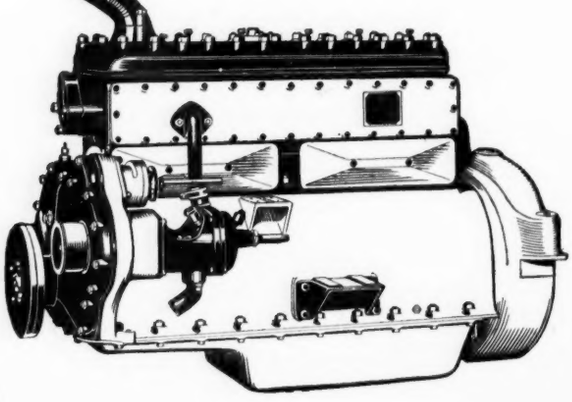
Detroit, U.S.A.

The Largest Exclusive Motor Manufacturer In The World



Red Seal Continental Motor with 6 cylinders, 4½ inch bore and 5¾ inch stroke.

A thoroughbred motor built exclusively for bus service.

Continental Motors

AUTOMOTIVE INDUSTRIES
VOLUME 52 *New York, Thursday, March 26, 1925* NUMBER 13

Capacity and Demand—Will They Meet or Will the Gap Widen?

Answer depends upon trend of business this spring. Conservative demand likely will hold capacity down but boom may lead to over-expansion.

By Norman G. Shidle

THE automobile industry today has buildings and equipment capable of producing at the rate of about 5,650,000 motor vehicles a year.

The chances that 1925 production will exceed 4,000,000 are not great and a good many estimates place the figure at 3,750,000, while some think it will be even less.

Is there likely to be a larger discrepancy between demand and production capacity at the end of 1925 than there was at the beginning?

Nobody can answer that question with certainty at the present time, but we are willing to hazard this guess:

If business continues to be good, but does not develop boom characteristics at any given period during the next nine months, the margin between demand and output may be reduced.

If, on the other hand, spring business comes through with a great rush, sudden stepping up of schedules becomes necessary and temporary car shortages appear in certain lines, the margin between these two factors at the end of the year is likely to be considerably greater than it is today. If a boom comes, we may forget the lessons of 1924 and over-expand again.

We are talking of what we think actually is likely to happen—not about what we think ought to happen. If a boom does come, we hope events prove our guess to be wrong.

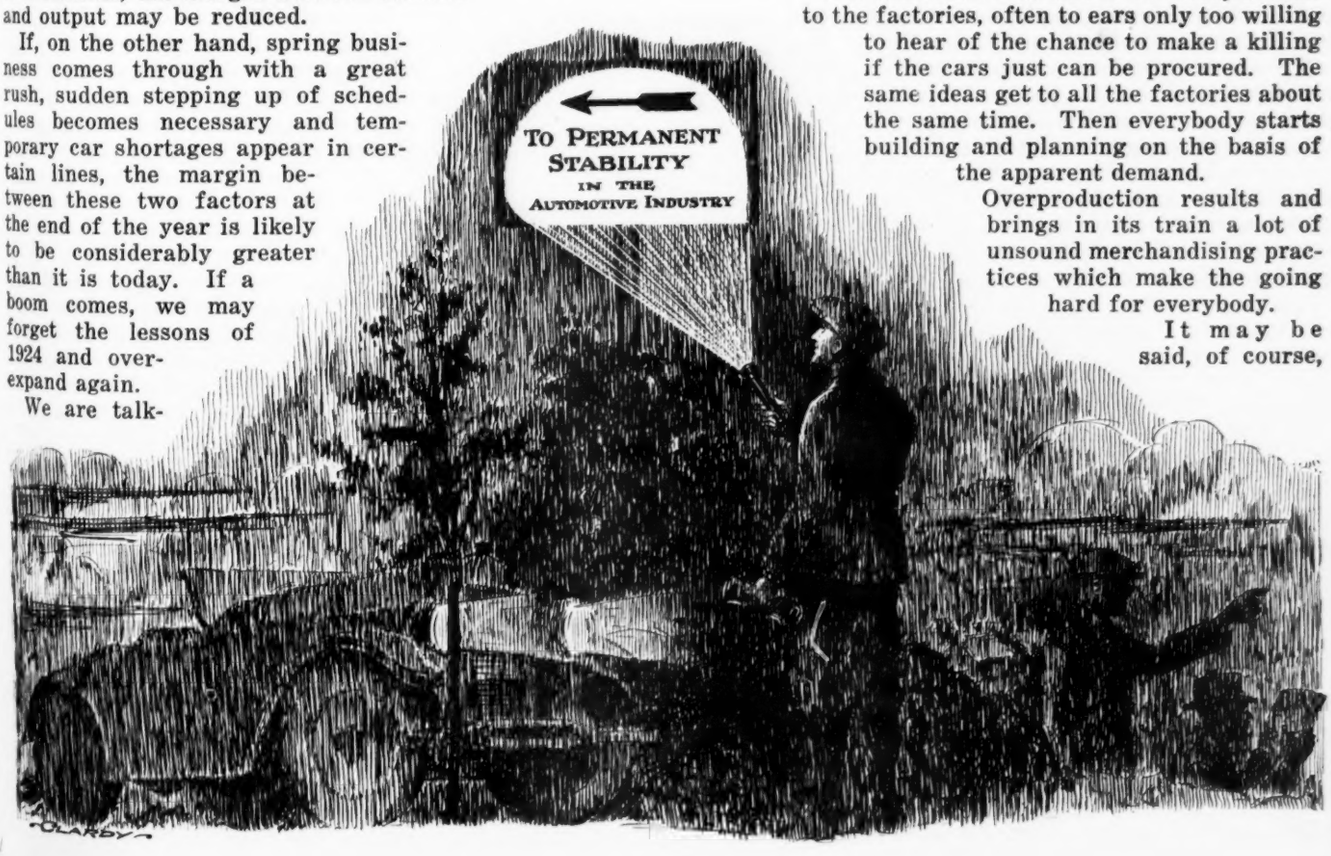
Every time that a boom has occurred in the past, pyramiding of demand has occurred and has resulted in over-expansion. When a prospective buyer finds he can't get delivery on one make of car, he goes around and makes serious inquiries about other makes. Dealer prospect lists grow rapidly, retailers see great interest on the part of the public, become enthusiastic and convey that enthusiasm to their factories.

The apparent demand is much greater than the real demand, brisk though buying actually may be.

All this retail enthusiasm is conveyed back to the factories, often to ears only too willing to hear of the chance to make a killing if the cars just can be procured. The same ideas get to all the factories about the same time. Then everybody starts building and planning on the basis of the apparent demand.

Overproduction results and brings in its train a lot of unsound merchandising practices which make the going hard for everybody.

It may be said, of course,



that the car builders learned their lesson last year as regards overproduction. Probably a good many of them did. But we are just pessimistic enough to fear that if a real boom comes along for a few months, the difference between actual production for 1926 and production capacity for 1926 will be greater than in 1925.

If business continues at a normal rate, however, the lessons learned in 1924 are very likely to be heeded. This is borne out by examination of what has happened thus far in 1925.

Producers Hold Fast

There is little tendency to increase capacity, either in passenger car or parts factories. Hudson has announced that its facilities will be increased to produce 1200 instead of 700 cars a day, but no other intentions of this kind have been indicated by other important makers. Nash has acquired additional facilities for use in manufacturing the new Ajax which is expected to be on the market within a short time, but the plant which he has taken over formerly was used for car production, so that the brick and mortar capacity isn't changed much one way or the other.

In a statement issued recently, Continental Motors Corp. states that, "We expect for 1925 capacity utilization of our present facilities," indicating that actual expansion is not contemplated at the present time. There is a tendency to increase capacity in certain parts of the tire industry. Firestone, for instance, contemplates adding to his equipment so that he can build 38,000 instead of 32,000 tires a day and 45,000 instead of 37,000 tubes a day. Body capacity is being increased in several instances, probably to take care of the increasing demand for closed jobs.

This question has more than an academic interest, because upon its answer should depend the marketing and production plans of individual companies throughout the industry. So long as there is in existence plant capacity to build more automobiles every year than the public can be induced to buy, the automobile manufacturer must continue to bear a burden of overhead which will reduce profits below the normal expectancy.

Extremely keen competition is bound to continue and difficulty is going to be experienced in ridding automotive merchandising of some of the unsound practices which beset it so long as capacity exceeds demand to any considerable degree.

While every manufacturer is looking to his own interests, he cannot avoid the effects of economic forces acting on the whole industry. Excess trading allowances on used cars are a direct result of oversupply, for instance, and the evils resulting accrue to every manufacturer in the business.

Parts Make the Whole

These general economic forces are generated by the separate acts of individual manufacturers. Every time one maker adds to his plant capacity he has increased the capacity of the industry and has changed to some extent the demand-capacity relationship.

But there is another side to the picture.

Announcements of mergers, consolidations and refinancing of parts, accessory, or vehicle companies are coming through in the news almost every week. There is no way of telling accurately just what these consolidations mean from the standpoint of increasing or decreasing producing facilities, but it is probable that they all tend toward lowering the capacity. Separate plants units often are sold and batches of machinery often are disposed of after a consolidation has been in effect long enough to work out new economies.

Then there is a continuance of the slow dropping out of weak companies which has been in process for several years. We have expressed the belief that always there will be a definite place in the automobile business for a certain number of small companies building an individualized product. That belief need not be repeated here in detail. How many constitute "a certain number" only time will tell. But on the whole, through the passing of complete organizations, the capacity of the industry is lower than it might otherwise be.

There is some question as to whether or not these defunct organizations are being replaced by new ventures of similar character as rapidly as they were a few years ago. Only a very exhaustive study would reveal the true facts, but the general impression is that money isn't being put into promotion of new companies with nearly so much abandon as it was five years ago. This doesn't mean that there isn't room for any new outfits. Far from it. That a new company can rapidly make a place for itself has been demonstrated very recently. It does mean, however, that new ventures are being made with more care and more forethought as to market possibilities than has sometimes been the case in the past.

Continuance of this tendency as time goes on will result in less and less plant capacity being thrown on the market as companies go in and out. Turnover among automobile manufacturers isn't going to be so great in the next decade as it was in the last.

All this indicates that production capacity in the automobile industry isn't likely to go up much in the next few years unless something in the nature of a big boom occurs. Even then, of course, a large proportion of manufacturers may hold fast and no harm may result.

When Will Demand Catch Up?

To answer the question asked, "When will demand catch up with supply facilities?" it becomes necessary to predict how rapidly output is going to grow in the next few years. That's something we aren't going to do.

Opinions differ as to the production at which the industry is likely to stabilize. It is generally agreed that the rate of growth never will be so rapid again as it has been in the past and that the industry is nearing its period of stability. O. C. Hutchinson, sales manager of Hupmobile, expressed the opinion recently that "a market for 2½ to 3½ million cars a year would continue indefinitely."

C. W. Nash, in a letter received last week, says: "I am a firm believer in the idea that automobiles will be sold in large quantities year after year, and it will surprise me very much if 1925 and 1926 do not exceed the consumption of 1923 and 1924 by quite a large percentage. At the same time, fewer factories will produce these cars, and most of the factories that do not produce them will have a capacity to build more than will be taken by the consumer."

On whatever level production finally stabilizes, radical increases from year to year cannot be expected from now on. If plant expansion in general is curtailed for some time to come, a reasonable balance between resources and demand should be reached within five years, perhaps sooner. From now on production capacity always will and should be slightly in excess of demand, as it is in practically every non-monopolistic, stabilized industry. But within the time mentioned there is every indication that the relation between capacity-demand in the automotive industry will be so adjusted as to make possible the elimination of unsound marketing practices—most of which are designed to meet a temporary need—and to permit reasonable profits year after year to companies both in the parts and vehicle field.

Acme Adds One-Ton "Flyer" to Truck Line

New unit powered with 28.9 hp. four-cylinder Continental motor. Better than 35 m.p.h. is claimed. Low body a feature. Price $1,295

TO meet the demands of high speed delivery service, the Acme Flyer of one-ton load capacity has been added to the line of the Acme Motor Truck Company of Cadillac, Mich. Due to the low height of the frame, the beds of the standard bodies are approximately 30 in. above the level of the ground. Speeds of 35 m.p.h. and higher are possible and ease of handling is insured by the 58-in. tread at front and rear which allow a turning radius of about 20 ft. Pneumatic cord tires measuring 30 x 5 in. are standard equipment all around and type B demountable rims are used. Full starting and lighting equipment is standard.

In addition to the new flyer chassis, this company is also producing standard bodies and cabs. The cab, which is listed at $145, is weather proof and fitted with 27-in. wide doors at each side and a two-piece windshield. An adjustable glass sash is fitted in each of the doors and a wide window is located in the rear wall of the cab. A well ironed open express body is listed at $80 and a full canopy type at $215. The price of the standard chassis is $1,295.

Power is supplied by a Continental S-4 engine having four cylinders of 4¼ in. bore and a stroke of 4½ in. While the standard rating of this engine is 28.9 hp., the brake horsepower at 2200 r.p.m. is 50 hp. Three point suspension and unit mounting of the engine and gearbox are used. Full pressure lubrication throughout the engine is obtained by means of a gear oil pump. A centrifugal water pump insures circulation through the cellular radiator which is housed by a pressed steel shroud. A Zenith carbureter and complete Autolite electrical equipment are standard. The storage battery is made by Willard.

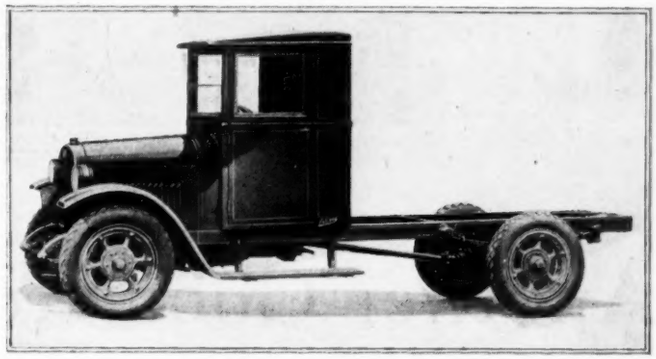
Both the multiple disc clutch and the three speed gearbox are supplied by Brown-Lipe. Blood Brothers universal joints are fitted at both ends of the one-piece tubular propeller shaft and a Hotchkiss drive is used. Columbia axles are mounted at both ends. At the front, ball bearings are fitted at the king pins and taper roller bearings at the wheel hubs. The axle is a heavy I-section drop forging. The rear axle is full floating with a gear reduction of 5 to 1. Bearing equipment is taper roller throughout with two bearings at each wheel hub. Both the service and emergency brakes are mounted on this unit, the drums being 16 in. in diameter. The former are external contracting bands of 2½ in. width while the latter are internal expanding shoes of 2¼ in. width.

Frame 189 In. Long Over All

Pressed steel side channels of 5 in. depth, 3/16 in. thickness and 3 in. flange width are tapered to conventional spring horns at the front end and tied together by pressed steel cross channels and angular brace bars at the rear end. Springs are semi-elliptic all around and are 2½ in. wide. Front springs are 38 in. long while the rear are 50 in. long, all being equipped with bronze bushings at the eyes. Wheelbase is 130 in.

The Ross cam and lever steering gear is used, being fitted with an 18-in. diameter wheel and spark and throttle controls. A vacuum tank supplies fuel to the engine from a cylindrical seamless steel tank of 15 gal. capacity. Chassis lubrication is effected by the Alemite system. The frame is 189 in. long over all, with a body allowance with no overhang at the rear end of 97 in. The standard open express body has an inside length of 102 in., a width of 53 in. and depth of 12 in.

Standard equipment includes electric head lamps, tail lamp and front fenders of car type fitted with splash guards. These fenders extend downward and backward to match with the runningboards, which are about 11 in. above the ground line.



New one-ton Acme Flyer

A FUEL gage for aeronautical purposes, based on the hydrostatic principle, has been brought out recently by the Pioneer Instrument Co. of 754 Lexington Avenue, Brooklyn, N. Y. At the bottom of the fuel tank is placed a small cell in which a certain amount of air is imprisoned. This cell is open at the bottom and the fuel in the tank presses on the air with a pressure depending upon its depth. The air pressure within the cell is transmitted through a tube to a small pressure gage on the instrument board, which is calibrated to read directly in gallons.

To compensate for expansion of the air in the cell and tubing due to changes in temperature and altitude, and consequent loss of air from the system, a small pump is built into the gage unit, and once a day the knob of this pump is pulled out and released. On the return stroke the pump automatically introduces the correct amount of air to balance the system.

A somewhat different gage is made for use on wing tanks, where the gage may be seen by the pilot if mounted directly on the bottom of the tank. This gage is screwed directly into a ⅜-in. pipe-threaded flange, which is welded or brazed to the bottom of the tank. In this gage the fuel, apparently, presses directly on the sensitive member of the gage, and the pressure is not transmitted by air, hence no correction is required for loss of air.

IN France all concerns manufacturing coal gas or coke are now compelled by law to recover the by-products and particularly the liquids which can be used as fuel in internal combustion engines.

Just an ordinary "country road" today — Tomorrow, a fine, hard-surfaced motor highway, thanks to Federal Aid

When this job is finished it will be more than a road; it will be part of a great coordinated national highway system

Another Good Roads Victory Won, But—*Keep Plugging!*

12 *to* 15 *years still needed to complete Federal Aid program and opposition of the East is still a menace.*
$150,000,000 *fund for* 1926-1927.

By R. L. Cusick

ANOTHER good roads battle has been fought and won in Washington. When President Coolidge affixed his signature on Feb. 12 to a bill which had provoked prolonged argument and debate in the Senate, the proponents of a constructive system of national highway development were assured of at least two more years of active Federal Aid to that end.

The bill in question authorized the appropriation of $150,000,000 for a continuance of the Federal plan of cooperation with the States in road construction during 1926 and 1927, half of the sum, or $75,000,000, to be expended each year. The appropriation with which to carry on the work during 1925 had already been taken care of under previous legislation.

The automotive industry naturally looks with interest upon any movement which contributes to the development of more and better highways. The Federal Aid road plan undoubtedly has been a leading factor in this development since its inception in 1916 and the thousands of miles of new roads for which it is responsible have played no small part in the steady and rapid growth of every class of motor traffic.

Since the movement is of such vital importance to its interests—and of no less importance to the broad, economic interests of the nation as a whole—the industry should not allow its attention to be turned lightly from the situation which inevitably develops in Washington on every occasion when new legislation is introduced to keep the wheels of Federal Aid constantly revolving.

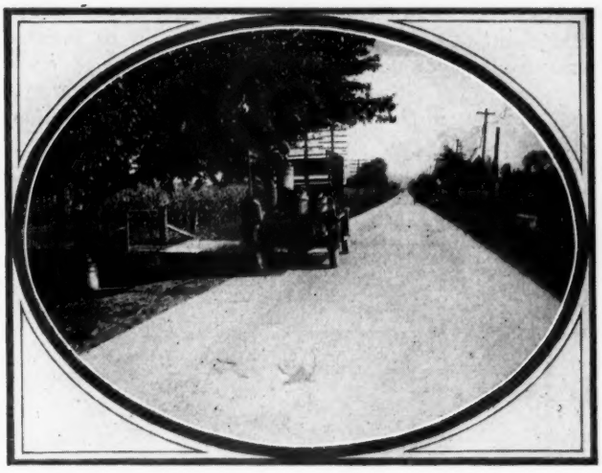
The situation is one in which opposition comes down to the edge of the stage and makes a vigorous protest against the plan.

This opposition has always been present to some extent—just as opposition is always sure to be found to any issue, regardless of its established merits—but if the records are consulted it will be seen that the opponents have been strengthening their lines during the last two years and they are likely to consolidate their forces for an even more determined assault in the future.

It therefore behooves the automotive industry, together with all other industries and organizations which are interested in seeing the good roads movement continued, to strengthen their fences likewise and allow no

laxity of action to jeopardize the success of their efforts.

The opposition that has appeared against the Federal Aid road plan is not due to any belief on the part of its opponents that the building of new highways or the improvement of existing ones is unnecessary — a waste of money. No one can successfully take the stand that we could continue for an indefinite period to get along with the roads we already have. Everybody agrees that there is a great deal of road work to be done before the rapidly growing requirements of the nation in this respect are met. Many years from now they will probably be discovering needs for new road improvements in the wealthiest, fastest-growing and greatest motor-traveling country that the world has ever known.



Federal Aid roads are contributing immeasurably to the wealth of the country by increasing land values, and are enabling the agricultural industry to put into effect more economical methods of distribution

Those who have set out to curtail, or to defeat altogether, any further operation of the Federal Aid plan base their arguments on other grounds. They come almost exclusively from the Eastern States, where the greatest wealth and population are centered, and, to use the words of Senator Copeland of New York, they "speak feelingly" of the fact that they do not share in the Federal road appropriations in proportion to the taxes they pay.

When the recent bill authorizing the appropriations for 1926-27 was under discussion by the Senate at Washington, Senator Copeland said he objected to its enactment because "my State would pay $20,000,000 to $25,000,000 of it and would receive back only $4,000,000."

Senator Sterling of South Dakota asked, "Where do the citizens of New York do the business out of which they make the money on which to pay their taxes?"

Because Senator Copeland's summary of the situation so far as his State is concerned pretty generally covers the main reason for the objection that has been raised by the other Eastern States, and because Senator Sterling's question carries an interesting suggestion as to why the objection may not be so well-founded as it appears, it might be profitable to carry the discussion on this point a little further for the purpose we can quote from the remarks of Senator Simmons of North Carolina, who addressed the opponents of Federal Aid in the Senate as follows:

"We are constantly reminded that one or two enormously rich States pay a larger part of the Federal income from taxation than a number of the States in the West and the South, which enjoy equal benefits under this legislation, and that these poorer States enjoy these benefits at their expense.

"New York is the richest State in the Union. New York City is the richest city in the Union. It is the richest city in the world. Yet a mere fraction of its wealth comes out of the activities and the resources of the State in which it is located. It is a mighty reservoir of wealth, but the streams that empty into that reservoir have their origin in every part of the Union, flow through every State in the Union, and empty their contents into that great national and international metropolis.

"New York is the great center of commerce and finance in this country, as well as the great center of wealth. There is no city in the United States that comes as near tapping all the sources of national wealth as does New York. There is, therefore no city as much interested in the prosperity, development and growth of every section of this Union, or that owes as much of its prosperity to the other sections of this great country."

As a war preparedness measure alone, the Federal Aid road plan would be worth considerably more than it has cost

In other words, it is altogether possible, and highly probable, that the construction of a new, improved highway through Colorado, for instance, would ultimately redound indirectly to the advancement of prosperity in New York by opening up new resources in the district affected, stimulating commerce and increasing the national wealth which is so largely controlled from

New York. As Senator Fess of Ohio put it: "I come from one of the States that would be called wealthy, but I believe the proper theory of the Government is that the Nation must be looked upon as a unit. We ought not to build territorial boundaries so high that a citizen is not interested in another section. The development of any section is followed by benefits which extend to all other parts of the country."

The greatest good for the greatest number is the basis on which the road question should be considered. The rapid development of transportation in the last 20 years has made the United States a country of comparatively short distances, despite the vast area it embraces. The people have been brought closer together; a matter of moment to the people of Maine may conceivably send a measure of concern rippling to Oregon. Roads, as sponsored by the Federal Government, are intended to be, and are, national institutions, and retardation of their development by the projection of local interests or local politics should not be countenanced.

An example of a road which is of very little practical value in its present shape. Federal Aid is converting roads of this type into modern highways at the rate of 9000 miles a year

Some of the Senators most active in trying to defeat or modify the recent bill based their opposition on the question of State rights, giving it as their opinion that such legislation was an infringement on the legal prerogatives of the States. This was obviously, however, only another way of saying the same thing which Senator Copeland frankly said: That the States on the side of the opposition were dissatisfied because they felt that their portion of the road fund was not proportionate to the taxes they paid.

There can be no very serious argument against the plan from the standpoint of State rights, as this point was thoroughly threshed out ten years ago, and it was clearly determined before the first Federal Aid law was passed that the plan was not a violation of State rights.

Senator Simmons, speaking of this phase of the situation, said: "I have repeatedly heard the argument that this law was a violation of the principle of State rights, but that is not a constitutional objection; that is an objection which goes to the question of how one feels with reference to the division of Federal and State power. There can be no question of the constitutionality of this measure. It is clearly within the provision of the Constitution authorizing the Government to establish post roads; it is clearly within the provision of the Constitution for the mobilization of our military forces in time of war, and it is clearly within the provision of the interstate commerce clause of the Constitution.

"These roads pass through a number of States. They are not State roads. Being interstate systems of highways, they are, for the purpose of regulation, if it comes to that point, as much within the control of the Federal Government as our railroads that run from State to State are within such jurisdiction."

The object of the Federal Aid plan is not to force upon the States something which they do not want, but to cooperate with them to the end that they may obtain easier, quicker and cheaper something which everybody knows they are naturally very desirous of getting—better roads.

The Federal Aid plan has been in force too long to leave any room for doubt as to its merits. Under its provisions there is gradually and systematically being developed in this country a complete network of connecting interstate highways which link up every city and every State in the Union and form trunk line arteries of transportation from the Atlantic to the Pacific and from Canada to Mexico.

This systematic construction of highways is one of the greatest advantages of the plan. Instead of each State developing roads to meet its own individual requirements, without any definte plan of correlation or coordination with its neighbors, all of the States are joined in one big national program. Each State builds toward a predetermined objective, knowing that the next State is building from the opposite direction toward the same point, and that the result will be not merely two roads in two States, but two links in a great transcontinental chain.

It is comparatively easy as a rule for a State to alter its road-building program to conform with the national scheme without sacrificing any of the value of the road as such, and by so doing it saves half of the cost of construction, the Federal Government defraying the other half. This is, of course, an advantageous arrangement for the States and his given untold impetus to road construction in every section of the country.

As a war preparedness measure alone, the Federal Aid road plan would be worth considerably more than it has cost. Nothing is so important in time of war as mobility. Men and materials must be transported quickly. An adequate highway system is equally as important as adequate fighting machinery—it is a part of that machinery. In any war fought today or possibly within the next 75 or 100 years motor vehicles will form one of the chief means of communication.

We have only to look back a few years to the World War to see what an important institution the motor unit has become in the national transportation picture. The railroads rendered remarkable service, but they were entirely unequal to the rush of traffic that developed. Hundreds of thousands of trucks took up the burden, truck fleets were organized, operating schedules laid out, and regular service runs made in some instances over distances of 500 and 600 miles. Without the necessary roads this would have been impossible and the war activities of the country would have been seriously impaired.

Federal Aid roads are daily increasing the economic value and usefulness of the motor vehicle. They are contributing immeasurably to the wealth of the country by increasing land values, and are enabling the agricultural industry to expand the scope of its operations and to put into effect more economical methods of distribution.

What the improvement in roads that the Federal Aid plan has helped to bring about means to the motoring public of the United States has recently been figured out in dollars and cents by the American Automobile Association and the result is most striking. It is shown that the motorists realize a yearly dividend of 10 per cent on the capital invested in roads through Federal Aid.

This dividend actually goes into the pockets of the motorists and represents the difference between the cost of motor vehicle operation over unimproved and improved highways. The differential, which is conservative, is based on extensive engineering tests of motor vehicle operation costs made in different sections of the country and for different types of roads.

A recent survey made in Kentucky shows that there is on the average a saving of 2½ cents a mile in the cost of operation over improved roads and highways. Some time ago a similar investigation conducted in Iowa indicated approximately the same saving.

It has been estimated many times that the average car runs approximately 6000 miles a year. A saving of 2½ cents a mile for 6000 miles amounts to $150 a year. For seventeen million automobiles this would mean a saving of $2,500,000,000 a year on gasoline, tires, parts, upkeep, renewals and all phases of operation.

This would be the total saving if every mile over which an automobile traveled was improved. But, of course, only 60,000 miles of highways have been improved by Federal Aid. This 60,000 miles represents slightly more than 2 per cent of the total highway system, which amounts to approximately two and a half million miles.

Two per cent of $5,550,000,000 gives $51,000,000, which can be legitimately credited to Federal Aid. The total capital expenditure for Federal Aid was $500,000,000, which yields $51,000,000 a year, or 10 per cent, in saving to the user of improved highways.

For the first time these studies make it possible to present in terms of dollars and cents the difference in cost to the motorist and the public in general between improved and unimproved roads.

As stated at the beginning of this article, two more years of Federal Aid is assured. The appropriations for 1926 and 1927 have been made. The machinery is already provided for the construction of approximately 25,000 miles of new roads before it is necessary to again replenish the fund. The total amount of aid thus far paid out by the Federal Government exceeds $323,000,000, calling for a like expenditure by the States. But the job is far from finished.

The complete Federal program at the present time calls for the construction of 174,000 miles of road. This is being built at the rate of about 9000 miles per year, according to Thomas H. MacDonald, chief of the Bureau of Public Roads, Department of Agriculture. It is estimated that from 12 to 15 years will be required to complete the major part of the system. This means that quite a few trips must yet be made to the well for the necessary appropriations. Those who have opposed the plan in the past will likely continue to oppose it in the future. This fact should be recognized and considered. The campaign to keep the system in force until the work is completed should be continued.

Nothing ought to be left undone to assure that the next battle is fought as victoriously as the last. Continued success should not be taken for granted. Mr. Warren's chances of becoming Attorney General were lost because Dawes took an afternoon nap.

Bureau of Standards Reports on Short-Time Fatigue Tests

An investigation of the "short-time fatigue test," and the factors governing the design of test specimens for it, has been made by L. B. Tuckerman and C. S. Aitchison of the Bureau of Standards, and their results are contained in Technologic Paper No. 275 of the Bureau, entitled "Design of Specimens for Short Time Fatigue Tests" (copies of which can be obtained from the Superintendent of Documents, Washington, D. C., at 5 cents each).

It is explained that, in addition to the classical endurance test of Wohler, a fatigue test proper, in which a specimen is subjected to repeated variations of stress until failure, there is a short-time fatigue test in which the fatigue limit is determined either by a change in the load-deflection relation or by an increase in the temperature of the specimen while it passes through cyclic stress changes. Experiments made by a number of investigators indicate that for some ferrous materials, at least, these short-time tests give results consistent with those obtained from endurance runs.

Some experiments on non-ferrous materials and high tensile strength steels make it seem doubtful if any general relation exists between the results of these short-time tests and endurance runs. Among the conclusions arrived at by Tuckerman and Aitchison are the following:

Among these short-time tests the load deflection and load temperature rise methods of test seem to promise to be of value for limited classes of material and, therefore, deserve further study.

With suitably designed specimens a higher sensibility can be obtained in these short-time "fatigue" tests, enabling simpler measuring instruments to be used.

The Sondericker type of rotating beam fatigue machine with a plain cylindrical specimen or a specimen with a slightly reduced cylindrical section between load bearings seems best suited for these tests, combining high sensibility with a simple specimen shape.

Making Tests of Giant Pneumatics

THE Bureau of Standards, in cooperation with tire manufacturers, has started a series of tests on the large sizes of pneumatic truck tires, in order to establish an adequate laboratory endurance test which can be applied in connection with Government purchases.

Considerable progress has been made, both by the Bureau and the tire manufacturers, in perfecting tests of this nature for 5-in. tires and smaller sizes, but very little laboratory work has been done on the 6, 7 and 8-in. sizes, which are strictly truck tires.

The same type of endurance machine which has been found to be satisfactory for the 4½ and 5-in. tires is being used for the larger sizes. The wheel on which the tire is mounted revolves in bearings supported by a movable car, and the tire is forced against a revolving drum driven by an electric motor, with a pressure corresponding to the appropriate axle load. For the 6-in. tires, which are the first sizes being run, an axle load of 2200 lb. per tire is used with 90 lb. inflation pressure, while for the 8-in. tires an axle load of 4000 lb. will be used with the tire inflated to 110 lb. per square inch.

It is thought that an endurance test of this nature is especially desirable for truck tires, since the tendency of the larger tires to develop high temperatures presents unusual problems in their design.

1925 Electric Truck Show Reveals Advances in Design

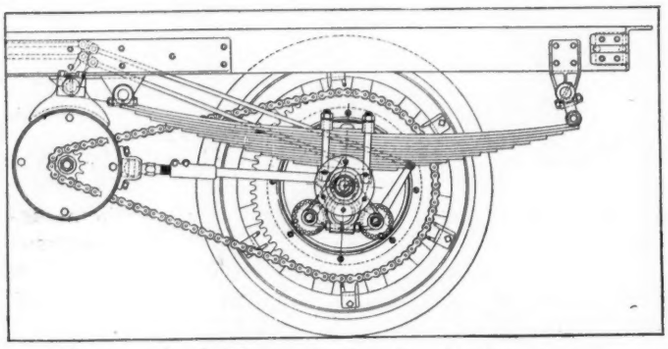
Resistance control discarded by one maker in favor of change in voltage control. New make of truck has built-in hoist for lowering and raising battery.

By P. M. Heldt

EXHIBITS comprising commercial trucks, industrial trucks, storage batteries, vehicle components and charging panels were the features of the Annual Electric Truck Show held at the salesrooms of the New York Edison Co., in New York City, last week.

There were no outstanding novelties at the show, but several of the exhibitors had made minor improvements in their products.

The hood on the Steinmetz electric has been redesigned to improve its appearance, being somewhat longer and higher than formerly. The driver's seat has been narrowed and is now of the regulation gas car width. A change has been made in the method of speed control whereby the use of resistance in the main circuit is done away with. One-third of the battery is carried under the hood, and in starting this part of the battery alone is applied to the motor. For the second speed the other two-thirds of the battery is connected to the motor, doubling the voltage; for the third speed the whole battery, connected in series, is connected to the motor, and for the fourth or high speed the field of the motor is weakened.



Rear end of Electruck chassis, showing motor mounting and chain drive.

Another new feature of the Steinmetz is that the speedometer drive is now taken from the countershaft instead of from the front wheel.

Electruck a New Product

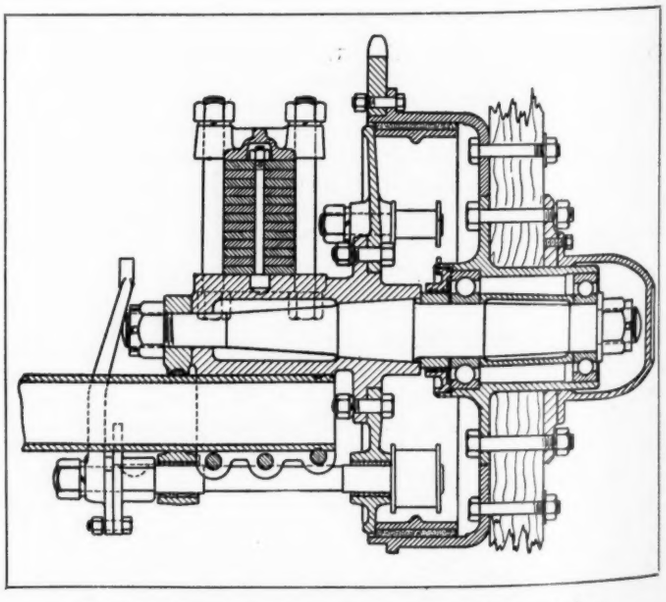
A comparatively new make is the Electruck, manufactured by the Electruck Corp., 534 West Forty-sixth Street, New York, in which are represented interests formerly connected with the Ward Baking Co., one of the largest users of electric trucks. The battery is underslung, and two motors are hung from the frame and drive directly to the rear wheels through roller chains.

The rear axle is built up, comprising a tubular center member to which the axle ends are clamped by three bolts each. The part clamped to the axle center form the spring saddle and has a circular flange to which the brake carrier is bolted, and the axle spindle is fitted into this part by means of a tapered and bolted joint. Ball bearings are fitted in both the front and rear wheels.

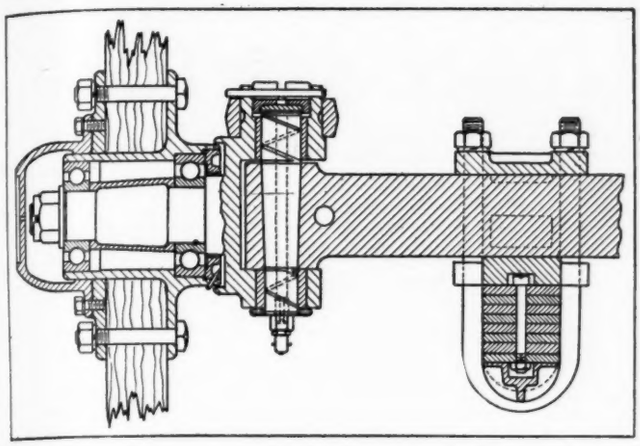
An outstanding feature of this truck is the method of handling the battery for flushing and charging. The battery is removed from the chassis by a lifting device built into the truck. This permits of lowering the battery as a unit onto a flat warehouse truck. Raising and lowering of the battery is accomplished by means of a crank, which operates a right and left hand worm and wheel from which latter there is connection to two shafts running parallel to the chassis frame. On the ends of these shafts are chain sprockets over which the lifting chains pass. On the ends of the lifting chains are links which connect to similar links on the battery cradle by means of transverse bars. This method of suspension is claimed to make it possible to get an unusual ground clearance, the clearance in the truck shown being 12½ in.

To Lower the Battery

To lower the battery, the crank is inserted and turned clockwise until it descends onto a truck, if it is to be entirely removed, or to a position where it is convenient for the mechanic to flush it, if that is the object. If the battery is to be removed the locking bars are withdrawn



Section through rear axle end, showing tubular axle center and separate spindle



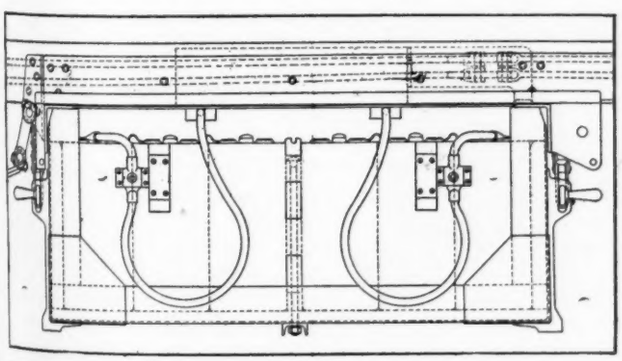
Section through end of front axle of Electruck

and the battery is then free of the truck.

On the C.T. truck, wing nuts are now put on the rear ends of the brake rods. These are of the automatic locking type, so that it is an easy matter to adjust the brakes. On this truck the two sets of brakes act internally on the same drums, each brake shoe forming substantially a quarter circle. It is a common experience that the shoes connected to the pedal, in other words, the foot brakes, wear considerably faster than the hand brake. On this truck it is possible, after the lining of the foot brakes has worn down as far as it is desirable to let it, to connect these brakes to the hand lever and the other set to the pedal, so that the brakes need not be relined until all of the brake linings are worn out.

Another Two-Motor Drive

The Commercial Truck Co., of Philadelphia, manufacturers of the C.T. truck, are also coming out with a new 5-ton model, which has a two-motor drive, instead of a four-motor drive, as their former 5-ton model. They will, however, continue to build the four-motor model for cases



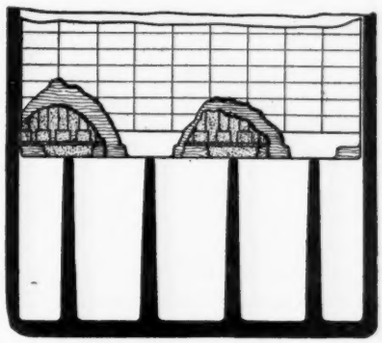
Method of carrying battery on Electruck

where unusual traction is required. The advantages of the new design is that it has slightly higher speed and lower current consumption.

A special demonstration was made by the Electric Storage Battery Co., to prove the ability of its Ironclad Exide batteries to stand up under heavy discharge rates. A 21-plate cell of this type, which has a normal 6-hour discharge rate of 56.5 amperes, is short-circuited through a strip of steel with a section about ⅜ in. square, which it raises to red heat, the current flow being around 2000 amperes.

This company has made some changes in its Ironclad battery. Formerly the cells of these batteries had two ribs at the bottom on which the elements rested, the ribs being 1¾ in. high. It was found, however, that when the mud space thus provided was entirely filled there was still enough active material on the plates to make them serviceable. Hence in the new cells there are four ribs, 2¾ in. high, and the plates are provided with two "feet" each. The feet of one set of plates rest on two of the ribs and the feet of the other set on the two remaining ribs. The separators extend all the way down to the ribs, hence even if the mud space should be completely filled with mud it would not short-circuit the cell.

Electric vehicle components were exhibited by the General Electric Co., and the J. M. Anderson Co., while charging boards were shown by the Allen-Bradley Co., the Cutler-Hammer Mfg. Co. and the Sarvas Electric Co., New York representatives of the Westinghouse Electric &



Detail of new Ironclad Exide cell, showing increased mud space and feet on plates.

Mfg. Co. Other exhibits comprised the Baker electric industrial truck and the Edison storage battery.

TESTS conducted by F. R. B. Watson at the Merchant Venturers' College, Bristol, on a 12 hp. low speed gas engine to determine the variation of the piston and exhaust valve temperatures with the jacket water temperature and the load led to the following conclusions:

(a) The maximum temperature range (from no load to full load) in the valve was from 248 to 782 deg. Fahr., or more than 530 deg. Fahr., and at the center of the piston head from 212 deg. Fahr. to 515 deg. Fahr., or about 300 deg. Fahr. In an engine with piston of larger diameter the temperature at the center of the piston head would more nearly approach that of the valve. The late Professor Hopkinson quoted for a 40 hp. Crossley engine temperatures of 750 deg. Fahr. and 860 deg. Fahr. for the piston center and the exhaust valve respectively.

(b) The temperature of this piston does not increase much by changing the compression ratio from 5 to 6.5; about 22 deg. Fahr. was measured, and there was practically no increase in the heat flow to the jacket water. The valve is about 32 deg. Fahr. cooler at full load, owing to the lower temperature of the exhaust gases with the higher compression ratio.

(c) The increase in temperature at the center of the piston due to an increase of 27 deg. in the temperature of the jacket water came out to less than this figure in most of the trials. However, the differences generally were such that they could be accounted for by the reduction in the friction with the hotter jacket. A slightly hotter valve (12-18 deg. at full load) was obtained in all cases with the hotter jacket, which was presumably due to a higher temperature of the gases leaving the engine rather than to a higher temperature of the valve seat.

The engine used for the tests, which was operated on coal gas, developed a maximum mean effective pressure (indicated) of only 78 lb. per sq. in.

New Bosch Electric Generators Have Voltage Control

Magnetic vibrator cuts resistance into and out of circuit. Other additions to line are starter with magnetic shift and combined generator and magneto.

By P. M. Heldt

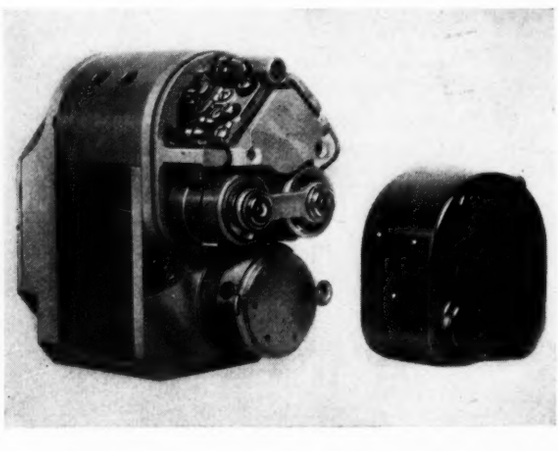
ROBERT BOSCH MAGNETO CO., INC., has entered the market with a line of electric generators and starters, a combined magneto and generator for motorcycles and an electric lighting set for pedal cycles, the latter comprising a magneto type generator driven by friction from either the front or rear tire.

The feature of the generators for passenger car, truck and bus service is that they are controlled on the constant voltage principle, the regulation being claimed to be so close that it is possible to run the lamps on the generator directly without the use of a battery, if desired. Ordinarily the generator is used with a battery, and constant voltage control then has the advantage that it gives a tapering charge, sending a heavy current into the battery when the latter is nearly discharged and reducing the charging current as a state of complete charge is approached.

The generators are of the four-pole type, but the armatures are provided with a so-called series winding, which calls for only two brushes on the commutator. These brushes are arranged at an angle of 90 deg. with each other below the commutator, making the space above the commutator available for the regulating mechanism. Ball bearings are fitted on the armature shaft.

Voltage regulation is effected by means of a resistance coil in series with the shunt field coil, which is cut in and out of circuit by a magnetic vibrator. The vibrator magnet carries both a shunt and a series coil. Any increase in voltage results in more rapid vibration of the regulator arm and, owing to the fact that the generator field has considerable inductance which does not permit the current flow through its field coil to change very rapidly, the average current through the field is less the more rapid the vibration of the regulator arm. The few turns of series winding on the regulator magnet compensate for the drop in voltage in the line accompanying an increase in load. The series current flows around the core of the regulator magnet in the direction opposite to that of the shunt current.

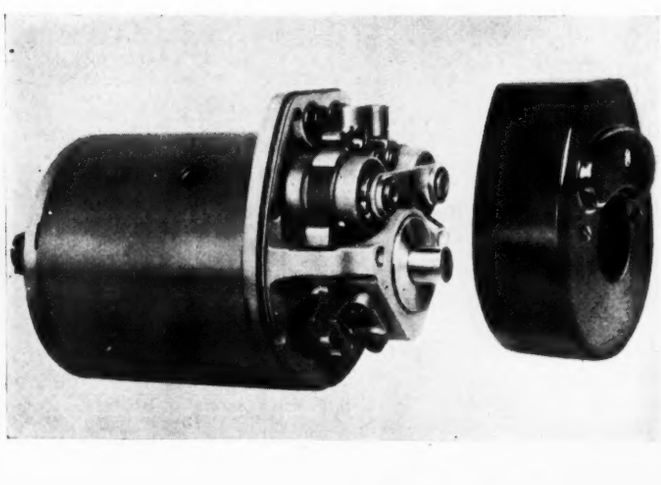
The usual battery cut-out is provided, and this is an

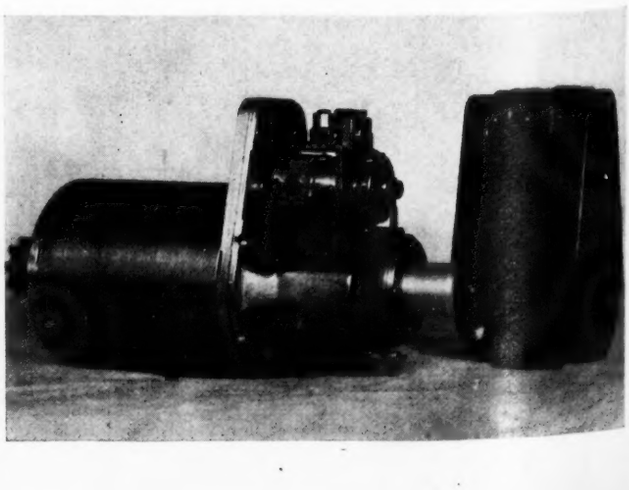


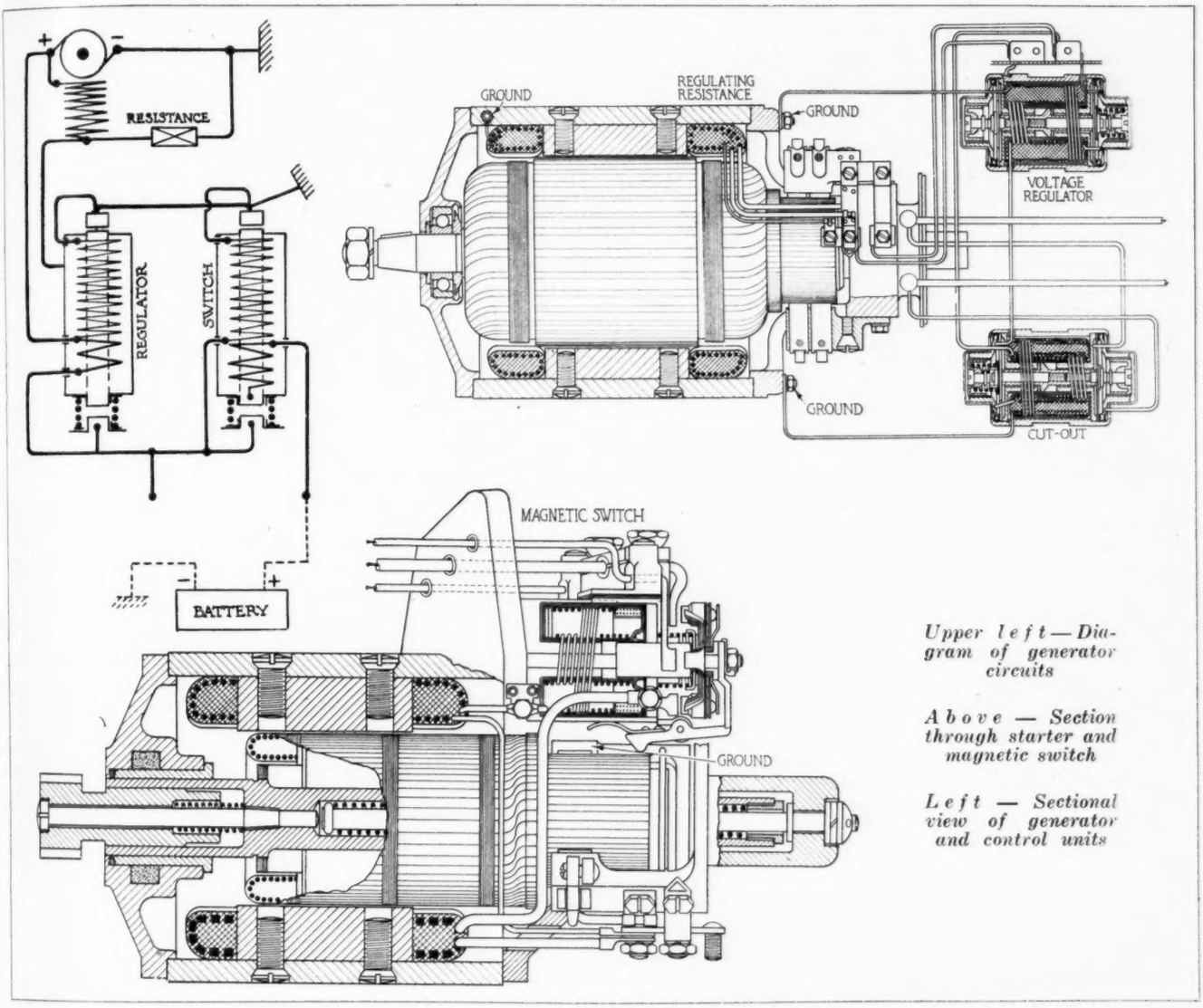
Below — Generator with constant voltage control. Voltage regulator and cut-out mounted over commutator

Left — Combined generator and magneto for motorcycles

Below—Starter with magnetic shift







Upper left — Diagram of generator circuits

Above — Section through starter and magnetic switch

Left — Sectional view of generator and control units

exact duplicate in external form of the voltage regulator. Regulator and cut-out are mounted side by side on top of the commutator housing, being held in place by means of a clamp so that they can be quickly removed for inspection or repair. A stamped metal cover protects the commutator and control devices, being clamped to a flange on the commutator end bearing and having a packed joint with a flange formed on the end plate of the generator.

Generators are made for both 6 and 12 volt circuits and in a considerable range in outputs, as follows:

Type E, 6 volts, 30 watts.
Type EL, 6 volts, 45 watts.
Type J, 6 and 12 volts, 60 watts.
Type Jva, 6 and 12 volts, 75 watts.
Type K, 6 and 12 volts, 80 and 100 watts.
Type O, 6 and 12 volts, 130 watts.
Type Ova, 6 and 12 volts, 225 watts.

In the starters use is made of the magnetic shift principle. When at rest the armature is not centrally within the field poles but is moved partly out of the so-called armature tunnel by means of a coiled spring. There are two windings on the field poles, the regular series winding and an auxiliary winding of many turns and comparatively high resistance. When a starter button on the dash is pressed the circuit is closed through the auxiliary winding and through the armature, a powerful solenoid action is exerted on the armature core and it is drawn into the armature tunnel. At the same time the armature begins to turn over, but only at a low speed. The simultaneous axial and low speed rotary motion make meshing of the starter gears positive.

At the same time the circuit is closed through the auxiliary field coil, the coil of the automatic switch is energized and this coil then tends to close the circuit through the main field winding. However, it cannot do this until after the armature has moved a certain distance in the axial direction, at which point the drop lever of the automatic switch, which holds the switch in the open position, is released. This protects the motor against heavy currents when the pinion and gear are not fully meshed. Shocks of meshing are relieved by providing a cushion spring between the armature shaft and the starter pinion.

Combination Switch

As part of the complete electrical equipment the company offers a combination starting, lighting and ignition switch, which is of the locking type and is mounted on the instrument board. This switch has a lever for switching on the lamps either singly or in various combinations; it carries a pilot light, which takes the place of electric indicating instruments and shows whether the system is working properly; it is provided with a key and in addition carries the fuses, a socket for plugging in a trouble lamp, the starter switch button and the cable terminals. When

the pilot light is lit up it is an indication that the battery is supplying current to the various circuits. For instance, if the car is in motion and the pilot light is lit up, it shows that the voltage of the generator has not attained a value sufficiently high to operate the battery cut-in, or else that the generator circuit is out of order. If the pilot light is lit while the engine is at rest it serves as a warning to the operator to shut off his ignition.

By means of the switch key it is possible to lock the magneto switch in the short-circuit or "off" position, to lock the lamp switch in any position and to lock the starter switch button so that the starter cannot be tampered with in the owner's absence. This switch is made in two types, one with four positions, which does not permit of switching on the headlamps and side lamps simultaneously, and another which permits of doing this.

Lamp Equipment

The headlamps supplied with this equipment are of the parabolic type and come in four reflector diameters, substantially 6¾, 8, 9½ and 11 in. It is claimed that the joint of the cover is such that no dust or water can get to the reflector and that the latter therefore never requires to be polished. The lamp socket, instead of being mounted in the shell, is mounted directly in the reflector, by means of a special bayonet type locking device. This socket takes only bulbs with a special base.

The side lamps are of the same general form as the head lights and come in two sizes, of 2¾ and 4¾ in. reflector diameter. For these lamps bulbs of tubular shape with a consumption of 10 watts are furnished.

A feature of the generator, which is an aid in replacement business, is that changes necessary to allow for a reversal in the direction of rotation can be easily made. This calls for a reversal of the field connections. The two leads of the shunt field coil have red and green insulation, respectively, and their connections are located close together on the commutator end plate. Arrows on this plate, which also are colored, indicate the direction of rotation corresponding to each method of connection.

Another new product is a combined magneto and generator for motorcycles. The generator is of the four-pole type and has constant voltage control by means of a magnetic vibrator. The output is 30 watts at 1500 r.p.m. The generator forms the upper part of the combined unit, having a cylindrical field frame to which the flat magnets of the magneto are applied, so that the magnetic frame of the generator also forms part of the magnetic circuit of the magneto. The generator is designed to supply current to the lamps directly without use of a battery.

Motorcycle Magneto-Generator

An advantage claimed for this combined machine is that it does away with the necessity for two separate drives where both a magneto and a generator are wanted, which is rather difficult to arrange on a motorcycle. All cable connections are at the end opposite the driving end, which gives protection against damage from oil.

The magneto portion of the combined unit is made in different forms to suit the type of engine to which it is to be fitted. The spark can be either fixed or a spark timing range of 20 deg., measured on the crankshaft, can be provided.

As regards mounting, it is recommended that the combined unit be clamped in place on a base by means of a strap of sheet bronze. A steel strap can be used if desired, but in order to prevent short-circuiting of the magnetic frame it must be held at a distance of at least 3/32 in. from the magnets by means of either a fiber strap or non-ferrous spacers.

The generator armature is driven from the magneto armature through a train of inclosed spur gears at the driving end.

An interesting novelty is an electric lighting set for pedal bicycles. It comprises a four-pole alternating current generator of the magneto type, that is, with permanent fields, together with a mounting bracket, a head light and the necessary wiring. The generator is mounted by means of a swinging bracket on either the front or rear fork of the bicycle and is provided with a metal pulley with milled surface which is firmly pressed against the rubber tire when the generator is in the working position, the pulley being only 13/16 in. in diameter.

When no light is wanted the generator is snapped into a position at right angles to the working position and its pulley is then entirely out of contact with the tire. Sufficient voltage is generated to give light when the rider walks beside his wheel at 3 m.p.h., and the voltage is kept within permissible limits up to speeds of 15 or 18 m.p.h., corresponding to armature speeds of 6000-7000 r.p.m.

The generator has an output of 1 watt at 4 volts at 2400 r.p.m. and weighs 1 lb.

Development of Metal Spraying

A REVIEW of the various uses of the Schoop metal spraying process was given in a paper presented to the Institute of Metals some time ago. The process has been worked since 1910 but has been undergoing development and finding new uses continuously. It is used, for instance, for the protection of the steel of vulcanizing pans, the coating with zinc or aluminum of containers intended for crude or light oils and the coating with aluminum of iron parts subjected to high temperature. For the latter purpose two methods are available—the first and the best being that of spraying aluminum onto the iron at a red heat after it has previously received a very thin coating in the cold state. The second method consists in spraying the aluminum cold and then transforming some of the metal into oxide by the use of chemical re-agents. It appears that these processes so far have been applied chiefly to the protection of metallic furnace flues, but it would seem that they might give a good protective coating for exhaust manifolds.

Following is a brief summary of the chief points brought out in the paper:

The gas-heated wire-melting type of pistol has so far proved to be the most suitable type of metal-spraying apparatus.

Usually sand-blasting precedes spraying. Preheating the article frequently improves the adherence of the sprayed coating.

Sprayed metal is formed of minute metal particles closely interlocked. It is as hard as or harder than ordinary metal but more brittle. It may be filed, turned, milled, and drilled, but is apt to flake if sprayed in parallel layers.

Any metal available in wire form and fusible in the oxy-hydrogen flame may be sprayed on to practically any surface—*e. g.* on to paper, fabric, wood, or metal. The surface produced is always matte, but may be polished if desired. The matte surface is an ideal foundation for paints.

Considerable technical experience with the process has been gained, and the use of duplex coatings promises exceptional results.

Completed structures are being uniformly coated all over by this process for protection against atmospheric corrosion, chemical attack, or furnace conditions.

By continuous spraying on one spot one may build up a material suitable for much of the repair and salvaging work required in engineering shops and foundries.

Just Among Ourselves

Jordan Gets Back from Florida

JUST been reading E. S. Jordan's reminiscences about his Florida trip. In his bulletin entitled "Good Morning—May I Sell You a Lot in Florida?" he says it's a great country and that on the day the sun doesn't shine they give the newspapers away—also that "Florida is learning that population follows roads and that general business prosperity follows transportation." The Florida real estate boom certainly has been beneficial to automotive sales in that State and, by the same token, the real estate development has been made possible very largely through the help of motor transportation. Pretty soon we'll have to move our editorial offices to Palm Beach if we are to keep in close touch with goings on among executives between January and April.

More People Lead Double Life

MORE and more people are leading a double life every year. Modern transportation facilities have made it possible for folks to do more living in a shorter space of time. Thousands of people are living a Northern life in the summer and a Southern life in the winter, where only hundreds did it a few years ago. This means that more people need more than one automobile—at least one for each life in most cases. Mr. Jordan says that "of course, anybody who is anybody is going to Florida every winter." Well, that kinda hits us hard, since we haven't been down there for many years, but we don't feel so very badly about it because we know personally at least four other men in the automotive industry who haven't been South this year. All of which leads us to remark that we can't think of anybody but Mr. Jordan who has to so great a degree the ability to broadcast a general letter which makes everybody who reads it feel that the writer is talking to him personally and to nobody else.

Used Car Plans and Permanent Sales

DESPITE the general disapproval among car manufacturers of used car plans involving special agreements among dealers in a given area, such plans have had an excellent effect on used car sales in many cases, according to the representative of a prominent finance company. Whatever the merits of the plan from the standpoint of trading allowances, this man says, there is little question that public confidence in the quality of the used car has been increased greatly where the plan involves reconditioning and certification of used cars before resale. Used cars once sold, stay sold. Records of cars coming back to this particular finance company reflect this fact quite clearly.

"Waddling" Troubles French Designers

THE phenomenon described by the term "shimmying" undoubtedly became a source of considerable difficulty first in this country, for although the balloon tire was introduced both here and abroad at approximately the same time, its use abroad has been confined to the smaller size car, with which the trouble is less acute. While there has been a great deal of discussion of the subject in this country during the past year, it has received little attention abroad as yet, but references to it are beginning to appear in the foreign press. In view of the fact that the phenomenon came into the limelight here first and the name "shimmying" given to it must be familiar in Continental Europe, in another connection, at least, it might have been expected that the same designation would be adopted in other languages, but the French speak of it as "dandrinement," which, when literally translated, means waddling. Another phenomenon in automobile operation that first gave serious concern to motorists in this country but is now becoming quite acute also in Continental Europe goes there by its original American name, at least in the technical press. We are referring to "crankcase dilution."

Plumbing the Depths of Public Psychology

THERE is a deal of talk about giving the public what it wants. Most talk of this kind is pretty sound from a merchandising standpoint. It's right costly to try to sell to Demos something he doesn't want very much. Just the same he often wants things subconsciously before the desire actually enters into his conscious mind. The manufacturer who makes the biggest success is the one who is clairvoyant enough to have some contact with Demos' subconsciousness.

Who Knows First What the Public Wants?

THIS idea is expressed in a letter we received the other day from F. J. Haynes, the Dodge president, who believes that "the reason the automobile business succeeds is that it honestly fulfills a public need and the reason why it continues to succeed is that the manufacturers of automobiles keep themselves informed in advance of the public, of the needs of the public, and take care of these needs before the public knows it has them." Looking back over the history of automotive successes that statement seems to hold true in practically every instance.

N. G. S.

Automotive Industries
March 26, 1925

More Light Needed on Efficiency of Marketing Methods

One ineffective or misused link in the chain can weaken entire marketing program and practices which apparently succeed for one manufacturer may fail entirely for another.

By Harry Tipper

THE last financial statements issued by a certain company in the automotive field, one of the leaders in its line, were quite unsatisfactory from the standpoint of profits, and not any too good from the standpoint of volume. For a number of years this company was pointed out as an eminent example of success and the various marketing methods it used were copied by other concerns because of the success which the company was securing.

The marketing methods have not been changed and they have not prevented the company from falling into difficulties. In other words some of these marketing methods may have contributed to the success and some may have contributed to the recent failure.

The whole history raises the question, which of the methods in this company's marketing program as a whole contributed to the success, and which methods did not? The fact that the success has not been sustained indicates that there is a weak link in the chain somewhere.

Let us enumerate, assumptively, the different links which make up the chain:

The sales force.
Advertising policies.
Selection of advertising media.
Extent of territory covered in exploitation of the products.
Nature of the territory selected.
The manner of gaining direct distribution, through jobbers or dealers, or both.
The price of the product to the consumer.
The profit margin.
Location of factory branches.
Factory practices; changes in design of product; quality.
The percentage of the marketing appropriation to capital and earnings.

Trouble Hard to Find

One or several of these links have proved inefficient in the long run and have brought about a slowing down of this company's whole marketing program but it is impossible almost for anyone, not fully acquainted with every detail of the company's operations, to definitely point out which were to blame.

For one manufacturer to adopt the marketing methods of another, therefore, simply because they seem to be working satisfactorily for the originator, is not safe. Several bad ones are almost sure to be picked with the good ones.

The company in question enjoyed its most successful years during the period of the most rapid expansion in the automotive field. Perhaps the company succeeded then in spite of some of its methods, because it made a good product and because the business was expanding so rapidly.

Of course, from an examination of the balance sheet, there was no way of finding out which method was good and which method was bad, because the business was growing so fast that the future was rosy in any case.

On the manufacturing side, no well-advised production engineer adopts a method simply because some other successful company has used it. He knows that not all the manufacturing methods of a successful company are correct, although the weight in general is toward efficiency. He further knows that methods which might be suitable to this manufacturing may not be suitable when transferred to some other plant. While the success of a company suggests the desirability of considering its methods, the production engineer does not accept them without thorough examination.

Decisions Based on Opinion

On the marketing side, however, mere opinion and impression still exercise a very large influence in the decision on marketing methods, and as a consequence the methods used by successful companies are accepted very frequently without any understanding of why or how they were arrived at, or what they have done.

Not long ago a manufacturer who had built his business on a certain method of distribution, and a certain continuous development of advertising and promotion, changed his entire scheme of advertising almost over night and altered his method of distribution.

Such a change indicates the lack of any thorough scheme of valuation. No manufacturer would think of changing his manufacturing methods over night, nor would he think of appropriating a new design which had no relation to his past efforts, but this change in marketing was made with very little detailed examination and largely because of the impression and opinion of the executive committee of the concern.

It is not too much to say that we do not know in this business what marketing methods are acceptable and what have failed as methods. It is true that Ford has been successful with certain marketing methods in general, but whether he would have succeeded more if he had modified these methods in some respects, or whether the methods could have succeeded in any other hands, is something which is very little considered by business men who try to study the effects.

Obviously no method of marketing is responsible for success in itself.

One manufacturer gives exclusive territory to jobbers and succeeds. Another manufacturer has never given exclusive territory to a jobber, although he makes a similar product, and he succeeds. One manufacturer builds his business advertising to the trade and only advertises to the consumer after he has established his success. Another manufacturer uses advertising to the consumer from

the beginning and succeeds. One manufacturer of cars obliges his retailers to adopt the flat service system, to keep a certain amount of parts, to keep books in a certain way, etc., and succeeds. Another manufacturer of cars permits his retailers almost all the leeway they like so long as they do a good business, and he succeeds.

Similarly as to failures. One manufacturer adopts the accepted scheme of distribution for an accessory through jobbers and retailers, and fails. Another manufacturer goes direct to retailers, and fails. One manufacturer attempts to build his business without advertising, and fails. Another manufacturer attempts to build his business with advertising, and fails.

In fact, from the history of the various concerns which are in business today, or which have passed through the automotive mill, evidence can be used to indicate that any method of marketing is successful, and that the same method is unsuccessful.

The old statement about figures lying would be made with equal force about the merchandising history of the concerns in the automotive field. It can be stated without any question that no concern in this field has operated on 100 per cent the best methods of marketing, even for that concern, and that a considerable proportion of the methods adopted might not have been successful at another time in other hands.

There is no doubt that every successful concern in this field has succeeded in spite of some of its regular methods of marketing, although undoubtedly a majority of their methods were either suitable in the first place, or effectively applied for the time in the second place.

All marketing methods have been subjected to more or less violent changes because of the lack of proper valuation, but this is particularly true of methods of distribution, methods of promotion and methods of advertising.

THE manufacturer who is seeking to improve his marketing methods should be cautious about adopting plans which have appeared successful when used by others.

The fact that a certain business has prospered over a given period doesn't necessarily indicate, for instance, that it has struck the right note in advertising.

Its advertising might actually be of such a nature as to work a handicap, and its success has come in spite of the advertising, not because of it.

And so with the various other factors entering into the general marketing program. We can't point to any particular one and say "That is good," unless we make a very close analysis of the inside of the whole program and understand clearly the relation of each separate factor to all the others.

Values Little Understood

No man would think of attempting to substitute milling machines for lathes in the factory just because they were all machinery. He knows thoroughly that machines are functional and their value is in accordance with their function. The same man, however, is quite likely to substitute branch houses for jobbers, direct mail for publication advertising, consumer appeal for trade contact, as though—because they are all advertising—they have no functional differences or importance.

Methods of marketing vary in their functional suitability just as much as the machinery in the factory. All of the machinery in the plant is machinery. All methods of marketing are marketing, but no method can be effectively substituted for another any better than lathes can be used for milling.

Every single development in marketing is a functional development, and has its functional advantages and suitability. The branch house of the manufacturer is an extension of the commercial facilities of the manufacturer, intended to function in a manner similar to the general office, but geographically convenient to some portion of the market. The jobber is an independent trader whose economic function consists in taking the goods from the manufacturer in large quantities and distributing them to the retailer.

The Function of the Jobber

The function of conveniently locating a manufacturer's office so that the distribution of the particular product can be handled more expeditiously is different from that of the jobber, whose function is to handle many products to the same customer, reducing the distribution expense because of the variety which can be handled.

Similarly, the letter or circular has a different function to perform from the publication, and the publication of one class has a different function from that of another. The circular and letter are normal extensions of business correspondence, giving information in the mass, where originally it was given by individual letter writing. They are specific individual communications from one concern to another, supplementary to, or in the place of, personal contact, and functioning in matters which would otherwise require individual attention.

The publication is not an individual matter at all—it is a public pronouncement suitable to the particular group reading the publication and concerned with those services of the company which are suitable for public and not purely individual consideration. While direct mail work is concerned with the individual problem, the individual contact or requirement, and is a private consideration, the publication advertising is concerned only with the public service and reputation. One derives its strength from its individual and private character and associations, the other derives its strength from its public obligation and its public reputation.

In the same way the functions of different classes of publications are different. The advertising which is done through trade publications functions as the public policy and expressed obligation of the manufacturer to merchants who represent the ultimate user and are possible customers. Its objective is to bring to bear the effect of these public expressions to reinforce, to supplement and to divert the judgment of his customers, or possible customers, in his direction.

The advertising which is intended to reach the ultimate user can express only the general desire of the manufacturer to serve the ultimate user by building an effective product. He has no means of selling the ultimate buyer except in rare cases; he has no means of insuring a distribution to any particular ultimate buyer. This advertising functions only as an additional extension of his public obligation and reputation, beyond the circle of his

customers, in the same way that the reputation of any good physician or engineer may extend beyond the circle of those whom he can serve directly.

Right Form Must Be Used

These functions of different forms of advertising make it impossible to use one form to do the work of another effectively. The promotion to customers must be done to the customers, of course—it cannot be done by leaving them out of consideration. Yet the attempt is frequently made to use one form of advertising to do the work for which another form is particularly suitable, and that attempt is just as inefficient as trying to use a boring mill in the place of a turret lathe.

Probably the chief reason for this difficulty lies in the fact that in only a few cases has the marketing been considered as a single object with each method directed to the same definite objective and every part of the operation complementing and supplementing the other part.

All methods of marketing, except the personal sale, are sales aids or mass selling, and they are useful as they follow the same course and policy as the sales work, reinforce it and supplement it, using the same arguments, considering the same problems and developing the same valuation.

The sale is made with a possible buyer—the man who is able to give the manufacturer the order is the most important element in his marketing, and in his normal sales work the manufacturer develops his market in this way. This same customer, or possible customer, is the most important element in the consideration of all mass selling or advertising work. The secondary element in the sales work is the man who buys to resell, but buys only indirectly. He is the first in the chain of indirect buying and next in importance to the actual customer.

Contact in the Mass

Normally the extension of the sales program develops a contact of more or less importance with these people and the mass selling or advertising should pursue the same program, except that it can precede the personal contact because of the smaller expense involved. The user is the final element in the indirect buying; it is very rarely economically valuable to provide any personal contact with this user, and any contact provided must be in the mass.

The same reasons which make it unnecessary to provide the personal contact frequently operates to make any mass contact of minor value. In all cases where this contact is of value, it is the last link of the chain, and the work upon it is effective only if the other links are in contact and the strength of the connection equally preserved all through. The object in determining any method for the marketing of a product is to provide the necessary volume with the least overhead expense and the most effective stability. Proper valuation in determining the original plan, reasonable continuity of policy in the methods used, and the concentration of every method of operation on the same objectives, is the ideal to be attained in securing this result.

The past history in this respect means comparatively little; in the rapid expansion of this field about all we have determined is that marketing is a necessary problem of the business. What one method of marketing will do for the efficiency of a program over a period of years has been the subject of too little analysis and too much opinion.

Future developments will certainly include the valuation of these methods so that it will be necessary to introduce violent changes in their operation in order that the line of their improvement will coordinate with the actual sales necessities. The operating expenditure, the capital involved, and its relation to the volume, will be studied much more carefully in marketing, and when this has been studied sufficiently, conservative business practice will indicate the wisdom of depending more and more largely on the known requirements of marketing and less on the speculative consideration of the unknown possibilities.

Patching of Upholstery Leathers Is Improved by New Processes

A YEAR ago the S. A. E. standardized upholstery leather, or, rather, issued specifications for full grain, machine-buffed and No. 1 split upholstery leather. In these specifications it is stated that A-selection hides shall contain no patches while B-selection hides may contain four patches not more than 1½ in. long. Since then patching methods have been developed which, according to the tanners, gives a patch which is normally quite invisible and is as strong as the unpatched hide, hence there is some possibility that the present specifications will be revised.

The practicability of patching grub holes and other defects in upholstery leathers was first pointed out by K. L. Herrmann of the Studebaker Corp. a year or so ago, and since that time quite a number of tanners have been at work on patching processes. When the S. A. E. Recommended Practice was adopted, a year ago, leather was not being patched in production by any tanner, but since that time a good many patched hides have gone out from the tanneries and according to the tanners no complaints are being received and the process seems to be working out to general satisfaction.

Pyroxylin Cement Used

The cement used is a pyroxylin composition or a mixture of pyroxylin with fish glue. Most of the tanners confine the patching to the lower grades of leather, such as splits and deep buffs. The patched portions are said to be equal to the rest of the hide in flexibility and it is impossible to detect the patches on the finished side.

Visibility, of course, depends upon the finish used, and it is claimed that with some finishes, such as the linseed oil, it is still possible to detect the patches. With the pyroxylin or dope finish the patch is quite invisible.

The cutting value of a hide can be greatly improved by patching, according to the claims of some tanners. Automobile manufacturers are being assured by the tanners that sufficient progress has been made in the patching process that they need not hesitate to cut a patch into a cushion, seat or back, with full confidence that it will not develop trouble.

One of the detail problems connected with the general one of a successful patching method is that of the development of a machine for skiving the hides at the grub holes. Machines for skiving the patches are available, but skiving the hide is a different problem. The patching can be done with a plain knife if great care is taken.

BIMETALLIC bars are employed in thermostatic controls and for temperature compensation in instruments. Although such bars are widely used, no satisfactory theory of their performance has yet been developed. Since the bureau receives numerous inquiries along this line, an investigation of the subject has been started.

This work so far has covered the development of a performance theory in its most general form, so as to include the curvature of the bars both longitudinally and laterally. The theory as developed has been tested experimentally for several invar-brass bars. The correspondence of the experimental and theoretical deflections is excellent, the two agreeing within less than 10 per cent.

Fuel Flowmeter Works on Weighing Principle

Measures the rate of flow of gasoline in pounds per hour. Mechanism includes a sensitive beam scale on knife edges.

A MACHINE for determining the rate of flow of gasoline, etc., in pounds per hour has been designed by Prof. Daniel Roesch of Armour Institute of Technology and is being built by the Gaertner Scientific Corp. of Chicago. A distinct advantage is claimed for measuring fuel flow directly in terms of weight, as the heating value of fuels is almost universally expressed in B. T. U. per pound.

Results obtained with volumetric flowmeters are affected by variations in the viscosity of the fuel due to temperature changes, and by small particles of dirt lodging in or near the orifices. Tests requiring expensive set-ups and considerable operating costs may thus become worthless due to unnoticed errors in fuel measurement.

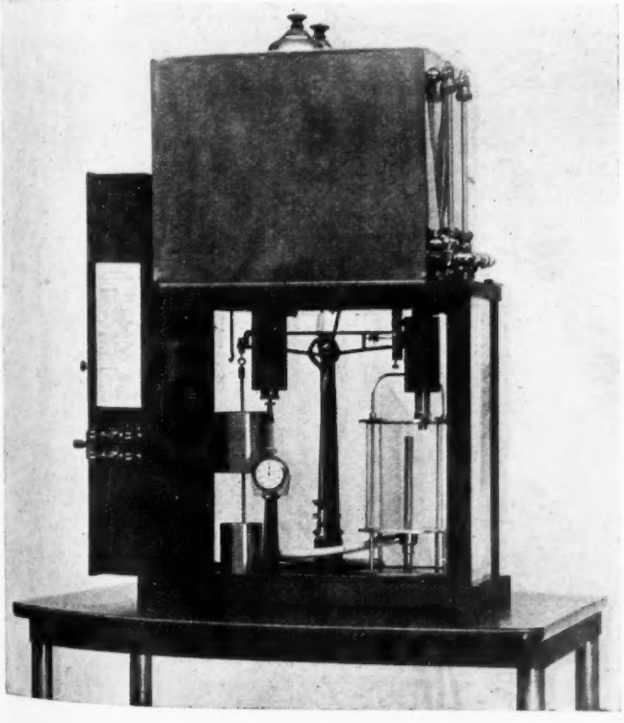
The weighing mechanism includes a sensitive beam scale mounted on knife edges. On the right arm of this scale is hung a glass container, which supplies gasoline to the engine being tested. On the left arm of the beam scales is hung a counter-weight. The glass container is intermittently supplied with fuel from the copper reservoir at the top of the machine. This reservoir has two compartments, so that two kinds of fuel are available by manipulation of proper stopcocks. The glass container is automatically held at nearly an even balance by a solenoid-operated valve which intermittently supplies fuel from the main reservoir.

With the master control switch (shown on the box at the left of the instrument) thrown to the right, this intermittent feed to the glass container will continue as long as the engine uses fuel. Tests can be started at any time the valve is not supplying fuel to the glass container, that is, when the side of the latter is heavy. The test is started by throwing the master switch to the left. As the glass container becomes lighter it will rise to an even balance with the counter-weight and close the mercury contact near the lower part of the center post of the beam scale. This is a double insulated contact, made with a platinum point in mercury, and is arranged so that it can be oil-sealed when highly volatile fuels are used. This contact carries the primary current of a relay, about 1/10 ampere. The secondary of the relay starts the stop watch.

At any time after the watch is started and before the end of the run, the desired weight is added to the pan under the glass container. This makes the right side of the beam go down and it remains down until a weight of fuel equal to the selected test weight is used by the engine. A second rising of the glass container again operates the platinum-mercury contact and stops the watch. This records the time necessary to use the selected weight of fuel.

After noting the time as recorded by the stop watch, the master switch is opened and then closed again to the left, in order to reset the stop watch to zero reading. The master switch is then thrown to the right and the test weight removed from the pan. This will refill the glass container with the fuel used during the test and then maintain the level and balance so that the machine is in readiness to test again.

The stand which comes with the instrument is made of telescopic Shelby tubing to permit height adjustment. Three angle iron frames hold the legs in position, and two finished panels form the base for the weighing machine and a table top for recording data. Three of these machines are in use in automotive laboratories.



Roesch fuel weighing machine

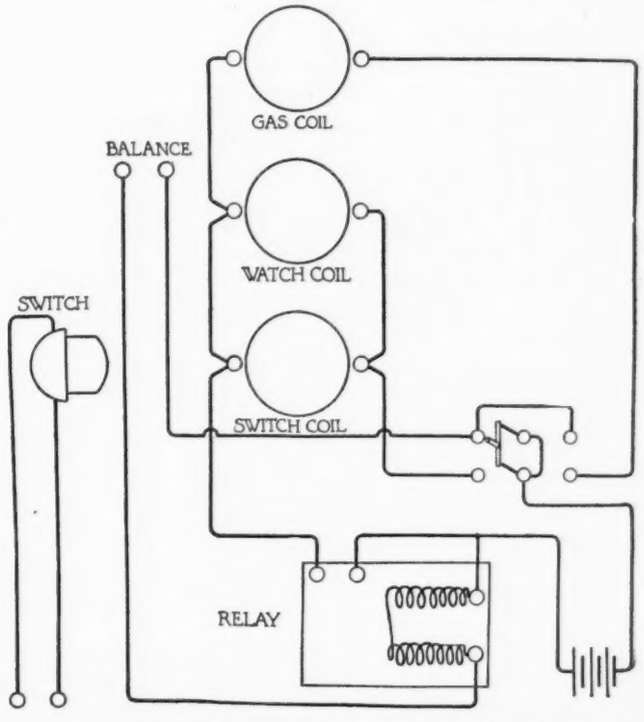
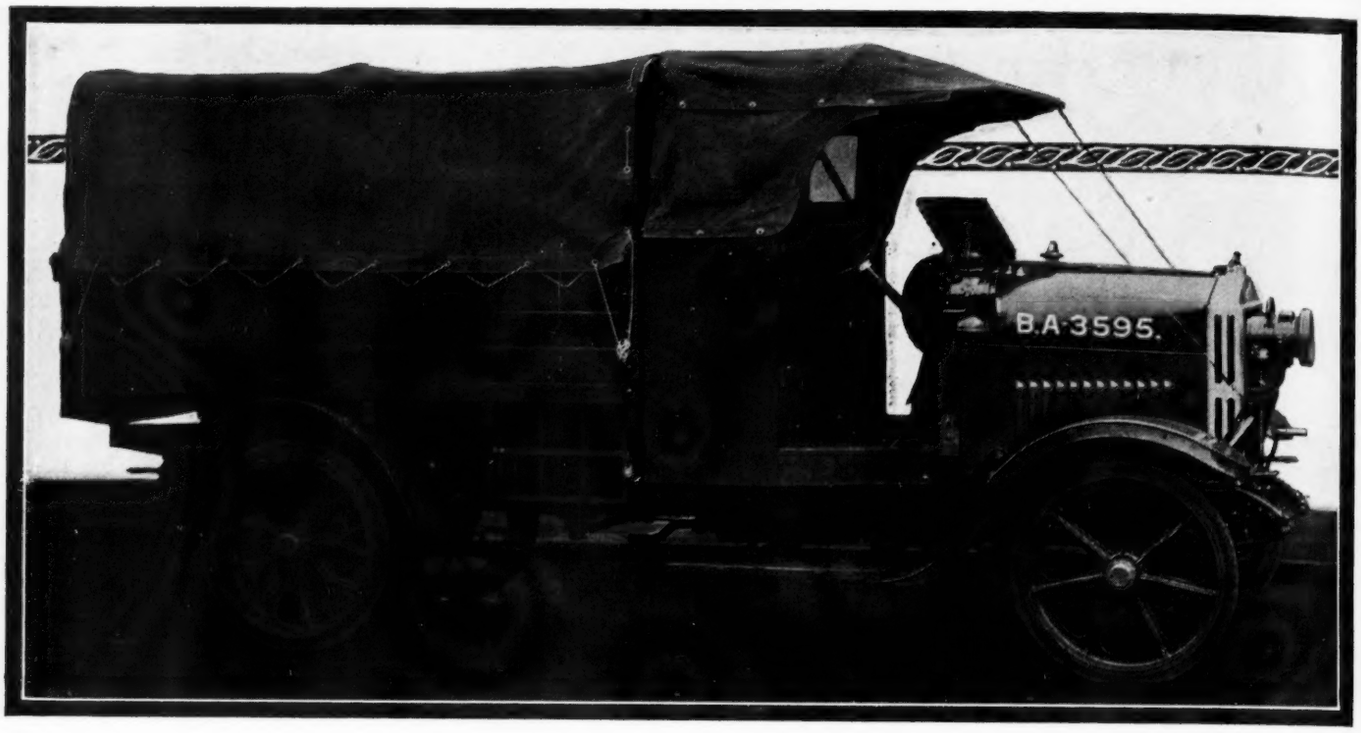


Diagram of electrical circuits of Roesch machine



British Truck Designed for High Speeds with Solid Tires

New Crossley unit has four-speed gearset providing ratios ranging from 7 to 1 on high to 38 to 1 on low. Engine is four-cylinder type. Total weight of chassis 4060 pounds.

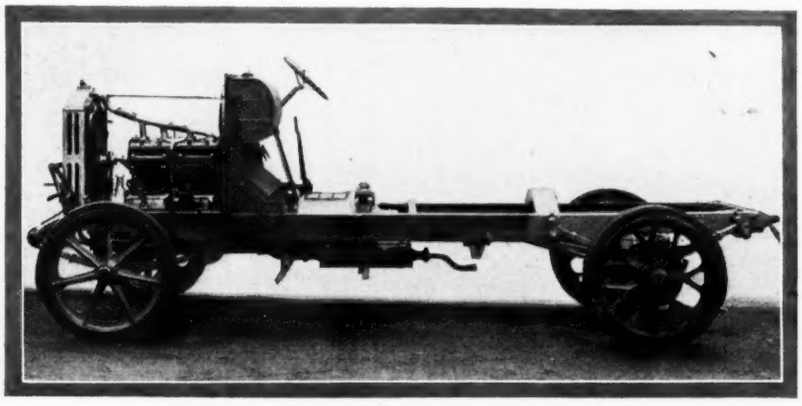
By M. W. Bourdon

CROSSLEY MOTORS, LTD., Manchester, England, of which Sir William Letts is managing director, has introduced a new high-speed truck chassis designed to run at 30 m.p.h. on solid rubber tires with a net load of 3400 lb. The first lot has been completed to the order of the Government of India and the model will henceforth be standardized on a production basis.

The four-cylinder engine has a bore and stroke of 4 x 5½ in. (276.5 cu. in), a five-bearing crankshaft, pressure lubrication, pair-cast cylinders with detachable L-heads, magneto ignition and silent chain distribution drive with adjustment.

An unusual feature lies in the crankcase and sump design. The former is of the barrel type, despite plain journals being used, while the sump is a shallow, rectangular and box-like construction with a flat bottom, and forms the all-over cover of the large opening at the bottom of the crankcase. The pump is submerged and driven from the end of the camshaft. High and low level oil cocks are provided, as well as a float gage. The

Illustrated above —The new Crossley high-speed truck with type of body supplied to Government of India



Side view of Crossley truck chassis. The engine is a four-cylinder type of 276 cu. in. displacement

engine is suspended at three points, with a pair of bearer arms at the rear integral with the crankcase.

Pump water circulation, gravity fed fuel and a Zenith carbureter are normal features, but the fuel system is distinct in having two tanks, one of 15½ Imperial gallon capacity on the dashboard and a reserve tank holding 10 gal. under the driving seat. A pressure pump is provided to discharge the contents of the reserve tank into the other if or when required.

The clutch is of the cone type, an intermediate shaft with flexible joints leading to the separate four-speed gearset. The gear and brake levers are supported by a tubular cast extension of the gearset cover, bringing them to the right-hand side of the chassis, isolated from frame distortion. The range of gear ratios is exceptionally wide, as follows: First, 38.1 to 1; second, 23 to 1; third, 13.1 to 1, and fourth, direct, with a rear axle ratio of 7 to 1. The reverse ratio is 30.8 to 1. The gears are of nickel steel. All gearshafts run on ball bearings and have solid splinings. An oil level cock is fitted.

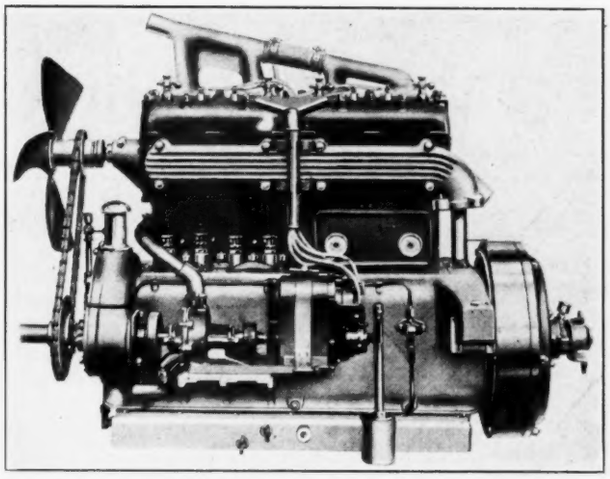
An inclosed propeller shaft has its tapered torque tube provided with diagonal struts. The full-floating rear axle casing is a one-piece steel stamping with a combined all-over cover and worm housing, for the final drive is by overhead worm gearing. Front and rear wheels (of the webbed cast-steel type) have Timken roller bearings and are equipped with 34 x 4 in. and 34 x 8 in. solid rubber tires.

The braking equipment consists of pedal-operated contracting shoes on the transmission and expanding shoes within the rear wheel drums. A feature of note is the use of small segments of cast iron to form the brake shoe liners and facings, these being easily renewable, for the shoes and segments in both sets can be detached with unusual facility.

Semi-elliptic springs are used throughout, and oil for chassis lubrication. The radiator, mounted on ball and socket joints, has separate top and bottom tanks of cast aluminum and gilled tubes of 5/16 in. internal diameter.

The wheelbase is 135 in. and the track 57 in., with a turning circle of 44 ft. 6 in. The chassis weighs 4060 lb. and the fuel consumption with full load and tilt-covered body is approximately 11 miles per Imperial gallon. The standard equipment lacks electric lighting, acetylene and oil lamps being normal.

This is one of the first British commercial cars designed for high speed on solid tires, and its performance on the road will be watched with considerable interest both here and in other countries throughout the entire world.



Valve side of Crossley engine with one valve cover plate removed

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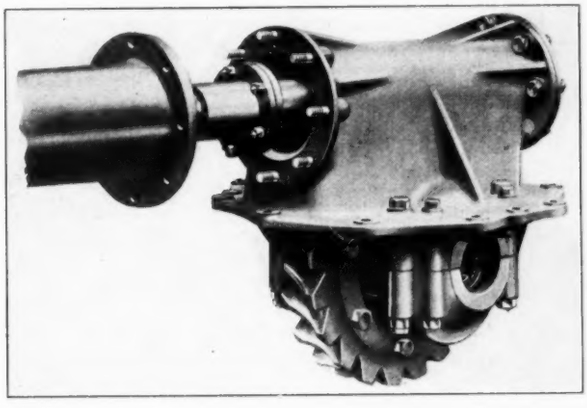
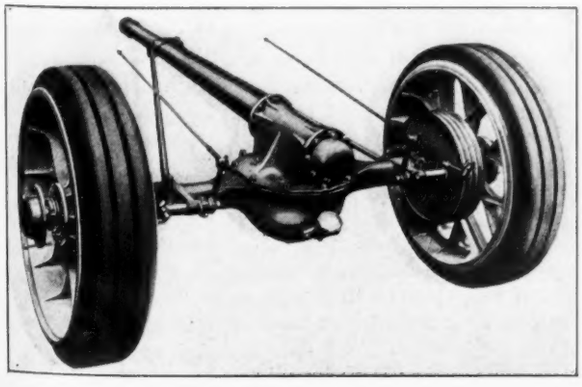
WHEN it became necessary recently to transport the stator of a 20,000 kw.a turbo generator from the works of the British General Electric Co. at Whitton to the Marylebone Power Station in London, it was found that no railroad between Birmingham and London could transport the part, which weighed 62 long tons, so there was no alternative to shipping it by road. The job was undertaken by a road transport firm and was completed in 10 days, the distance between the two points being 113 miles by rail and considerably more by road, particularly since a route had to be selected which permitted of transporting the heavy weight with the least danger.

The stator was carried on a truck having two four-wheel bogies, the gross weight being 75 tons. The wheels of the forward bogie were 24 in. in diameter and those of the rear bogie 33 in., which permitted the forward bogie to be turned through a right angle underneath the truck platform. All wheels were 12 in. wide and so arranged that the track was 2 ft. wide. Two traction engines were normally used for haulage, while a third one, which ordinarily hauled the coal truck, was available on hills.

Wherever the surface of the road seemed to require it, or where there were underground mains, steel plates were laid down for the wheels to travel over.





The rear axle is of the full-floating type and the casing is a one-piece steel stamping.

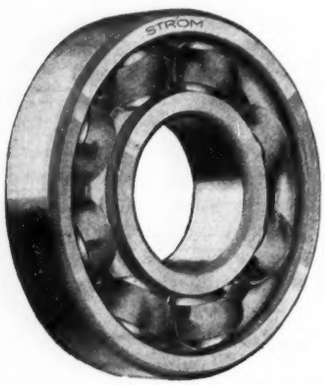
In the view above the worm and worm wheel are being removed from the Crossley rear axle

NEW MOTOR PARTS

Strom Deep Groove Ball Bearings

A NEW series of deep groove ball bearings with larger or a greater number of balls than ordinarily used has been placed on the market by the Strom Ball Bearing Mfg. Co. of Chicago. The bearings are of the same bore and outside diameter as the standard light, medium and heavy series, and therefore are interchangeable with these. The grooves of the races present an uninterrupted path for the balls to run on, which is conducive to quiet operation and long life of the bearings.

Retainers for these bearings are of the wide ribbon type and are pressed from heavy stock, in order to keep



Super-Strom ball bearing

the stresses low. They are formed to make spherical pockets for the steel balls, and the two halves meet and are riveted together with one rivet between each pair of adjacent balls, without spacers between. It is claimed that the design is such as to reduce the space between balls to a minimum and that the rivets are located in the same circular line as the points of pressure between ball and pocket, whereby the strain on the rivets and plates is reduced to a minimum. The rivets are a press fit in the holes, which latter are held to pilot limits in size and location.

With the deep grooves and the special design of retainer used, the balls fill up a larger proportion of the space between the races than in the old design. For instance, if the retainer is removed and the balls are allowed to collect at the bottom of the raceway, with the ordinary design the horizontal line through the two end balls will pass substantially through the axis of the bearing, while in the Super-Strom bearing it will be above the axis.

Retainer and ball assembly

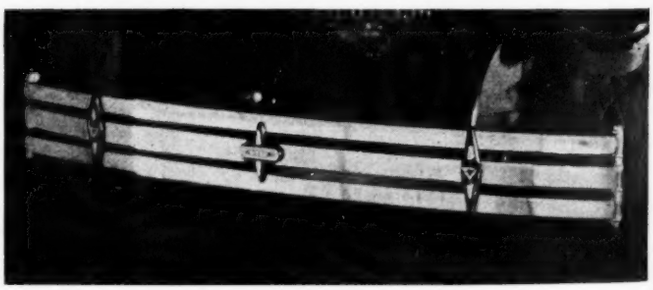
Bearing steel is purchased by the Strom company in three forms. Small annealed rounds are turned directly into rings, larger unannealed rounds are forged into rings in the company's own forge shop, and bearing steel tubing of alloy steel also is turned into rings. The forgings are annealed in both electric and oil-fired furnaces; race rings are quenched individually to assure uniform hardness throughout the section, and all rings are drawn.

After being heat-treated, a few rings from each lot are fractured for a check on their structure. Each heat-treated ring is also subjected to a severe bounce test, to eliminate cracked or checked rings from reaching the assembly floor. This bouncing test is repeated after each grinding operation.

Balls used in these bearings are made of alloy steel and are individually forged into spherical shape. The heat treatment is varied with the size of the balls to insure uniform hardness. The button head rivets used for holding the halves of the retainer together are made of heat-treated rivet stock and their heads are spun over to conform to a standard button head contour.

The Strom Ball Bearing Mfg. Co. has issued load tables for these bearings which show their greater load capacities, the increase being said to be as high as 38 per cent in some cases.

Sentry Three-Bar Bumper



The new Sentry Three-Bar Weed bumper

A BUMPER known as the Sentry Three-Bar type has been added to the Weed line by the American Chain Co., Bridgeport, Conn. It is said to have been developed to meet the demand for a bumper for medium and large cars which will give maximum protection and at the same time add to the appearance of the car. It is designed to fit on all cars of this type at the correct height. Fittings and nuts are of bronze and therefore rust-proof. The upper and lower bars measure 1¾ in. and the center bar 2 in. Because of the increased contact area provided by the three bars, the bumper is more likely to meet others squarely instead of skipping over or under and causing trouble.

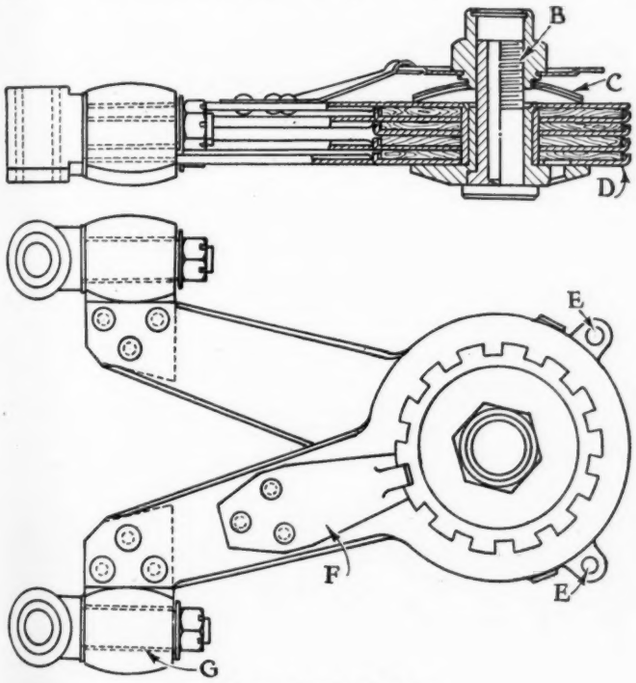
Maximum fender protection is provided by the curved ends, which are made unusually stiff. The bars extend from fender edge to fender edge so as to protect without interfering with close work in parking and traffic. The

AND ACCESSORIES

rear bumper curves outward to allow for spare tires, and curves inward at the fenders for compactness and ease in handling.

New Italian Shock Absorber

A MECHANICAL type of shock absorber for which a number of advantages are claimed has been developed by the firm Excelsior Ammortizzatori Italiani, Via Palazzo Bruciato 60, Florence, Italy. The retarding action



Excelsior shock absorber

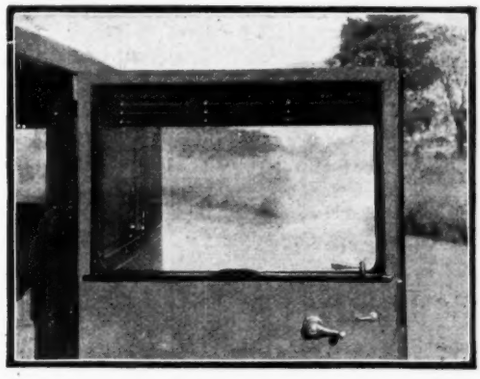
is said to be auto-progressive, that is, the resistance to relative motion between axle and frame increases with the deflection of the spring from its normal position. This progressive action is obtained by causing the nut, which backs up the star-shaped spring pressing the disks together, to move with one of the arms of the shock absorber, while the bolt is secured rigidly to the other arm. The result is that as the spring compresses the friction disks are pressed together more and more, and the resistance to compression of the spring increases rapidly, whereas when the spring is under normal load the disks are under very little pressure and therefore offer very little resistance to spring action.

This shock absorber can be built to exert a progressively increasing resistance both while the spring compresses and when it rebounds. Both right hand and left hand shock absorbers are manufactured, the only difference of importance being that the center bolt in one case has a right hand thread and in the other a left hand one. The way the shock absorbers are normally supplied by the manufacturers, the pressure on the plates increases as the arms close up (compression of the body spring) while if the shock absorbers for opposite sides of the car are interchanged, the pressure will increase when the spring rebounds.

In order to be able to feel the amount of resistance between the various disks, the center disk *D*, which is free to rotate in both directions, is provided with drilled or punched out lugs *EE*, and by inserting a special wrench into the holes in these lugs and pulling on it, the frictional resistance can be gaged.

The adjustment of the star-shaped spring *C* is locked by means of the nut *F*. Connection of the shock absorber arms to the frame and axle is made by means of universal joints.

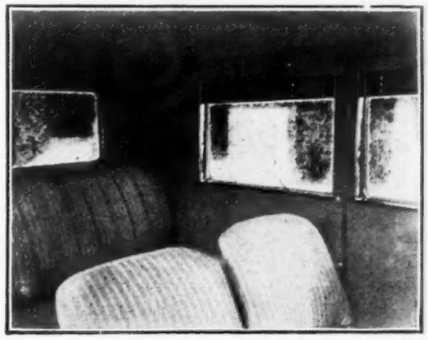
Pontiac Closed Car Ventilator



Pontiac ventilator installed in car door

A NOVELTY in closed car fittings has been introduced by the American Forging & Socket Co. of Pontiac, Mich. This is a ventilator for closed cars which is fitted in at the tops of the windows and doors, the method of fitting being such that there is no interference with the raising and lowering of the windows. The ventilator is made of sheet steel and enameled, and is claimed to add to the appearance and last the life of the car. It is said to be rattle-proof.

This ventilator is made in four sizes, for glasses 11-16¼ in., 16¼-21¼ in., 21½-26¾ in. and 26¾-32 in. wide, respectively. The ventilator is claimed to keep the air within clean under all conditions, without causing drafts.



Pontiac ventilator installed in door and rear quarter window

Exports of Cars, Trucks, Tires and Parts for

COUNTRIES	GASOLINE PASSENGER CARS										TRUCKS					
	Up to $500		$500 to $800		$800 to $1200		$1200 to $2000		Over $2000		Up to 1 ton incl.		1 to 2½ tons		Over 2½ tons	
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Austria																
Azores and Madeira Islands	15	$5,005	1	$800	2	$2,094	2	$2,817	1	$2,172	4	$1,460				
Belgium			32	23,804	62	65,766	44	66,102	5	11,975						
Bulgaria																
Czechoslovakia																
Denmark	1	477	6	4,620	34	36,917	23	36,328			74	42,240	2	$2,204		
Finland	25	12,136	1	581	5	5,463	10	15,267	1	2,245	9	11,002				
France			1	825	30	33,253	4	6,304	2	5,230						
Germany	3	1,215	38	27,714	46	48,920	54	80,683	12	28,961	20	10,630	10	12,040		
Greece	8	4,318	11	7,018			2	2,744	5	13,206	6	3,286	1	3,016		
Hungary	1	400					1	1,771								
Iceland & Faroe Islands																
Italy	859	252,890	2	1,546	1	1,200					895	230,342				
Latvia																
Lithuania																
Malta, Gozo and Cyprus Islands	24	7,690	1	631												
Netherlands	6	2,817	40	30,668	95	107,259	73	109,509	16	42,572	2	2,687	3	4,340	1	$10,000
Norway	14	5,368	1	825	20	22,712	1	2,116			3	2,104	3	3,459		
Poland and Danzig					1	1,008			1	2,525						
Portugal	8	3,872	6	3,068	12	12,569	1	1,349								
Rumania			5	2,870	4	4,934			2	5,050	4	2,000				
Russia									1	2,415						
Spain	36	17,847	76	57,734	158	163,986	125	197,380	17	43,397	9	5,412	10	18,411		
Sweden	42	19,535	39	31,222	72	75,263	27	38,524			7	7,747	2	2,788		
Switzerland			4	3,092	65	65,878	63	91,867	8	21,723	2	1,000				
Turkey							3	4,510	2	4,502						
England	9	4,278	445	291,167	263	282,314	238	349,727	22	58,184	15	16,932	36	31,122	1	1,550
Irish Free State					9	9,678					6	3,589				
Yugoslavia, Albania, etc									1	2,400						
United States																
Canada	36	9,277	164	100,991	148	154,166	40	57,761	15	43,375	6	4,867	47	69,059	8	21,568
British Honduras			1	700												
Costa Rica			4	2,162	5	5,083	1	1,645			1	500				
Guatemala							2	2,775			14	7,5 0	2	2 761		
Honduras	7	2,221			1	1,115	1	1,372								
Nicaragua					2	1,840	4	5,744					2	4,266		
Panama	6	2,646	16	10,793	16	15,585	13	18,894			9	3,394				
Salvador	1	336			24	23,246	5	7,968					1	1,287		
Mexico	488	165,585	147	89,826	164	162,960	60	85,589	11	32,242	131	62,084	17	15,068	4	17,200
Newfoundland			1	800							1	106				
Barbados			3	2,368	3	3,299										
Jamaica	17	6,184	22	17,443	10	9,723	7	9,823			13	5,284	2	1,285		
Trinidad and Tobago	12	5,163	8	6,101	3	2,941			1	2,250	2	880	1	1,375		
Other British West Indies	10	3,270	3	927	5	5,440	1	1,653			5	1,180	2	3,636		
Cuba	285	79,398	90	6 537	64	65,722	35	49,993	19	65,178	161	42,123	10	18,684	9	35,467
Dominican Republic	41	13,926	3	2,091	20	20,173	5	6,965	3	8,287	6	112	4	4,125	1	4,528
Dutch West Indies	1	308									2	704				
French West Indies	3	920														
Haiti	5	1,962	4	2,949	5	4,910					1	765	1	1,160		
Virgin Islands																
Argentina	989	453,187	345	259,966	382	418,282	94	135,492	12	35,872	20	21,435	31	61,225	13	39,620
Bolivia			3	2,276	6	7,199	5	8,449	1	2,635			2	4,052		
Brazil	218	67,858	90	70,499	229	235,452	63	94,731	21	53,135	186	52,233	2	2,204		
Chile	191	43,244	29	20,077	27	31,300	19	29,866	4	12,807	113	37,602	20	31,871	18	49,689
Colombia	24	8,819	11	7,275	13	13,767	30	44,622	5	16,270	16	5,964	13	4,616		
Ecuador			10	7,581	3	2,910	1	1,276	1	2,467			1	1,841		
British Guiana			6	4,750												
Dutch Guiana																
Paraguay																
Peru	54	22,009	13	8,171	39	41,809	18	26,920	2	6,553	66	27,086	12	14,137	12	24,358
Uruguay	250	80,847	30	17,881	23	25,676	18	26,513	3	8,708	115	29,998				
Venezuela	113	46,188	27	18,378	51	51,356	14	21,354	1	2,455	38	18,130	2	4,787	1	5,025
Aden																
British India	25	10,793	132	102,048	55	56,034	12	17,317			62	42,371	85	48,903		
Ceylon	5	2,270	5	4,147	18	18,837	5	7,066			32	27,596	17	26,285	4	7,638
Straits Settlements	7	3,150	14	11,808	23	24,589									1	2,665
Other British East Indies																
China	41	15,248	20	15,285	12	12,971	7	10,145			14	6,044	3	2,135		
Chosen																
Java and Madura	3	1,397	51	37,873	42	43,535	10	15,260					11	12,027		
Other Dutch East Indies			5	3,645	2	1,974	4	6,218					4	4,513		
French Indo China											5	2,053				
Hejaz, Arabia, Iraq	36	12,588														
Hongkong	5	1,800	5	3,051			3	4,118			16	6,412	1	1,519		
Japan	30	14,850	10	6,936	18	18,766	10	14,476	1	2,601	1	600			3	15,421
Kwantung			8	4,784									1	1,413		
Palestine and Syria	70	24,600	29	21,355	9	9,937	8	10,794			1	664				
Philippine Islands	47	20,390	28	21,593	37	39,405	11	16,471	7	19,250	35	18,195	14	18,830		
Siam			3	2,432	2	2,000										
Turkey															3	10,800
Australia	1,036	416,652	1,368	903,329	649	702,933	150	234,804	11	29,183	99	57,468	42	68,487	32	104,120
New Zealand	73	35,715	15	11,830	161	172,683	48	71,815	2	5,153			36	48,908	1	3,600
British Oceania					1	1,031										
French Oceania	1	300	2	1,200	1	900	1	1,981							1	3,900
Other Oceania							1	1,541								
Belgian Congo	2	720			1	1,063					20	7,040				
British West Africa	3	884									11	12,364	67	72,203		
British South Africa	137	67,258	253	190,394	470	504,844	40	57,226	3	6,740	11	9,499	9	9,407	2	5,395
British East Africa	57	28,236	6	4,517	9	9,400	5	7,287	1	3,210	14	7,000	2	1,075		
Canary Islands					1	1,110	2	2,545	1	2,330						
Egypt			19	13,639	10	9,754	2	2,767								
Algeria and Tunis	17	5,496	3	1,720							2	808				
Other French Africa	8	2,264	9	6,816							12	4,419				
Liberia	1	400														
Madagascar																
Morocco	39	12,872	3	1,722	2	2,053					18	6,696				
Portuguese East Africa	3	1,422	4	2,070	13	14,419					11	4,728	1	3,400		
Other Portuguese Africa	3	1,484									8	2,816				
Spanish Africa	5	1,975														
Total	5,456	$2,033,960	3,731	$2,578.921	3,658	$3,892,306	1,426	$2,128,234	221	$607,258	2,334	$817,211	532	$643,924	115	$362,544

January, 1925 | Canadian Exports |

ELECTRIC VEHICLES		PARTS	TIRES						PASSENGER CARS						TRUCKS		PARTS	COUNTRIES
			Casings		Inner		Solids		Up to $500		$500 to $1000		Over $1000					
No.	Value	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	
		$565	11	$226	5	$20					1	$984						Austria
		1,063																Azores and Madeira Islands
		451,589	1,777	50,302	1,308	4,908					3	2,933					$64	Belgium
			30	405	60	106												Bulgaria
		87	126	2,299	47	135												Czechoslovakia
		265,998	5,396	59,964	6,035	8,573	74	$1,860	131	$49,310							6,555	Denmark
		32,723	1,052	22,927	1,220	3,309							1	$11158			841	Finland
		281,093	1,063	22,119	1,380	3,428					4	3,910						France
		39,116	664	28,574	684	3,301			1	419	2	1,385	1	1,345			3	Germany
		6,719	1,718	23,230	2,951	5,141	328	10,640					3	3,410			80	Greece
		378	16	146	40	61												Hungary
		542	42	439														Iceland & Faroe Islands
		27,859	26	391	1,328	7,426												Italy
			32	555														Latvia
			158	2,643	234	481												Lithuania
		440	100	925														Malta, Gozo and Cyprus Islands
		44,590	1,451	22,234	1,576	2,933	55	649			9	8,798	5	6,190			35	Netherlands
		13,853	436	4,914	505	650	53	1,563									2	Norway
		4,880	4	114	4	10					3	2,850	3	3,901			39	Poland and Danzig
		5,577	297	3,643	299	483												Portugal
		2,479	10	140	15	32							2	2,410				Rumania
		3,313			160	720												Russia
		147,306	4,452	46,950	4,302	6,282	186	4,976									55	Spain
		42,853	1,151	19,726	936	1,669	8	454									500	Sweden
		1,355	301	5,153	290	575	2	179					1	1,348				Switzerland
		2,329					1	31										Turkey
3	$4,875	286,603	15,035	157,359	7,226	10,994	1,855	42,383			52	31,028			350	$54,930	27,369	England
		17,203	2,510	18,467	2,492	2,407												Irish Free State
		100	69	563	158	161												Yugoslavia, Albania, etc.
									2	305							5,643	United States
1	50	1,105,646	606	8,674	383	1,139	54	1,928										Canada
		126	11	77	26	50												British Honduras
		2,464	74	1,102	67	117					3	2,932	1	1,287				Costa Rica
		5,727	99	1,460	4	16							4	5,306				Guatemala
		2,855	68	1,099	96	195												Honduras
		1,188	71	936	29	70												Nicaragua
		4,949	744	11,661	559	1,423	24	893										Panama
		7,858	171	3,214	275	643	12	422									11	Salvador
10	4,249	116,031	7,046	76,066	5,532	10,249	126	4,397			8	7,461	8	9,724				Mexico
		267			50	59											28	Newfoundland
		3,728	55	738	53	86			12	4,060					2	644		Barbados
		11,620	101	1,199	64	209	72	1,167			3	1,565					49	Jamaica
		5,185	214	2,905	271	463	18	471	12	4,442	6	4,148			6	2,044	18	Trinidad and Tobago
		6,289	88	1,111	253	635	12	247	8	2,890	1	593	1	1,001				Other British West Indies
		67,448	6,290	59,669	4,826	9,494	799	24,819									61	Cuba
2	3,086	14,883	815	7,922	2,194	3,309	130	3,560			2	1,955						Dominican Republic
		2,157	173	1,813	186	270	2	30	1	416								Dutch West Indies
		1,768	98	1,389	52	144	14	520										French West Indies
		4,749	337	5,790	284	673	2	46										Haiti
		955	38	358	28	42												Virgin Islands
		456,317	9,374	103,129	9,817	15,628	361	10,231	39	15,597	89	80,892	67	79,151			65,333	Argentina
		272	33	505	53	138					1	957	5	5,647				Bolivia
		257,532	7,753	70,633	3,387	4,216	319	7,096			100	80,225	30	36,087			50	Brazil
		47,456	881	11,386	274	524					2	1,756	5	5,920				Chile
		27,404	1,090	17,068	2,057	3,618	80	3,362			1	947						Colombia
		8,143	28	596	307	566												Ecuador
		2,115									4	2,554			2	644		British Guiana
		626																Dutch Guiana
		2,233																Paraguay
		54,539	823	12,322	1,528	2,847	20	1,056			7	6,240	10	12,606				Peru
		19,836	2,659	39,137	668	1,178	44	960	49	22,291	13	10,693	3	3,051			3	Uruguay
		20,586	722	9,613	716	1,296	20	390	5	2,067			3	3,862				Venezuela
			42	297	72	92			5	1,410					4	1,288		Aden
		39,895	3,845	35,777	1,381	2,088	186	4,754	387	130,817	38	29,866	18	20,430	71	23,008	14,440	British India
		4,708	1,780	19,679	859	1,187	49	1,082	35	12,510	7	5,468			2	553		Ceylon
		19,115	100	1,595	54	163			248	86,291	40	24,606	2	2,106	84	27,562	17,248	Straits Settlements
		133																Other British East Indies
		13,017	1,066	11,619	413	559	126	2,959			6	3,925						China
		2,509	125	1,077	100	130												Chosen
		20,619	696	8,197	474	922	383	8,743	107	32,585	13	9,916	6	7,870	58	19,016	15,367	Java and Madura
		3,894	22	423	22	69	8	217										Other Dutch East Indies
		1,968																French Indo China
		1,190	65	575	130	150												Hejaz, Arabia, Iraq
		6,934	35	1,034	5	19											32	Hongkong
5	6,792	55,712	6,298	63,273	4,909	9,578	544	10,060			8	6,715	12	13,788				Japan
																		Kwantung
		10,230	282	4,701	234	674							2	2,227				Palestine and Syria
2	6,135	30,686	4,850	53,490	5,397	9,890	505	10,993										Philippine Islands
		659							18	4,409					18	6,912	3,400	Siam
		392																Turkey
		191,045	6,202	95,807	6,638	13,186	1,175	32,080	949	273,373			6	7,014	689	237,271	46,367	Australia
		62,544	6,413	74,347	2,887	4,759	446	16,612	446	145,996	358	306,597	39	46,987	114	41,466	16,458	New Zealand
		213	16	65					4	1,248	1	509						British Oceania
		972	14	186	16	11	10	431										French Oceania
		575	42	424	15	23	156	3,840	1	469	3	2,594			3	1,134	147	Other Oceania
		2,937	4	233														Belgian Congo
		12,458	320	4,232	16	39			18	4,790					7	2,066	108	British West Africa
		90,469	1,170	17,667	1,884	3,451	29	667	103	40,010			2	2,449	6	1,932	9,048	British South Africa
		13,290	156	1,732	100	154	18	325	53	19,611					26	10,592	5,163	British East Africa
		3,959	188	2,354	855	130							1	1,348			22	Canary Islands
		9,647	658	5,871	803	1,100					1	948	1	1,287				Egypt
		338																Algeria and Tunis
		4,890					20	268										Other French Africa
		148																Liberia
		44																Madagas ar
		7,970							1	416	1	543						Moro co
		1,744	232	2,212	265	334			5	2,163	3	1,587						Portuguese East Africa
		1,885			60	74												Other Portuguese Africa
		500																Spanish Africa
23	$25,187	$4,560,854	112,017	$1,330,847	93,083	$168,884	8,326	$217,361	2,640	$857,895	850	$683,622	242	$288,910	1,442	$431,062	$285,073	Total

Says Steam Cooling Has Little Effect on Power Output of Engine

Editor AUTOMOTIVE INDUSTRIES:

Considerable confusion has arisen during the past few years about working principles underlying steam cooling. I believe it is well to assist, whenever possible, to reduce or to eliminate such confusion. With this in mind may I discuss briefly a question which came up at the Vapor Cooling Session at the S. A. E. Annual Meeting, and which was reported in AUTOMOTIVE INDUSTRIES of Jan. 29, p. 193.

It is stated by the reporter of the discussion that "steam cooling reduces the amount of heat needed on the intake manifold to secure vaporization and hence improves volumetric efficiency." In the first place, I think it is well to consider that in a given engine the total amount of heat required to vaporize to a given degree, a given amount of explosive charge is independent of the cooling system; however, what is implied in the paragraph quoted is probably that the amount of heat taken from the exhaust gases is reduced when a steam cooling system is used, since it can be assumed that the temperature of the water in the jackets is higher and consequently the temperature of the jacket walls is also higher with a steam system than with a conventional system.

With reference to the second statement, that the volumetric efficiency is improved with steam cooling, that of course is wrong, using the terms in their conventional sense. The volumetric efficiency of an engine is reduced particularly if the intake manifold is water jacketed. However, even if the intake manifold is not water jacketed the volumetric efficiency of the ordinary engine is reduced as the temperature of the water in the jackets is increased; thus the question arises what is the effect on power output of increasing the jacket-water temperature from 40 or 170 deg. Fahr., for instance, to 212 deg. Fahr.?

At the Vapor Cooling Session, it was stated that according to the experience of one member the power output of an engine was reduced by increasing the water temperature. The experience of another member was just as clear and definite and showed that the power was increased. Now, it is wrong to generalize from these facts and assert that increasing the water temperature from 170 to 212 will increase or decrease the power output without going into details. Here is what happens. As the temperature of the water and consequently that of the jacket walls increases the volumetric efficiency is reduced; but the piston friction also is reduced more or less, depending among other factors on the extent to which the viscosity of the oil is reduced as the jacket temperature is increased.

Thus, to sum up, as the water jacket temperature is increased from say 40 to 170 or to 212 deg. Fahr., the power output will decrease or increase depending on the net amount of power gained or lost due to the two major factors just referred to. As the temperature is increased from 40 to 170, if there is a loss in b.hp. of 5 per cent due to reduced volumetric efficiency and a gain in b.hp. of 3 per cent due to reduced friction, then evidently the net loss will be 2 per cent; similarly for any other temperatures or conditions we may wish to consider.

With reference to the article in question, may I call attention to a typographical error on p. 304, at the end of the paragraph headed "Two Forms of Radiator"; it is said that "local circulation is due to natural convection and to ebullitional of boiling"; this should read ebullitional currents. Ebullitional means boiling.

As to Fig. 4 in the AUTOMOTIVE INDUSTRIES report referred to above, I may add that r is intended to indicate the line between core and tank, and the diameter of the pipe connecting the two tanks marked q should be large enough to avoid a water seal between the two tanks. In this manner vapor evolved at either tank will find its way up into the condenser n. Of course, in practice, the two tanks are combined into one and thus we get the Rushmore form of construction which was described in AUTOMOTIVE INDUSTRIES, May, 1921. In my analysis of the various forms, I have, to show more clearly its principle of construction and its main novelty, indicated two tanks, q.

N. S. DIAMANT.

Getting Good Body Design

Editor, AUTOMOTIVE INDUSTRIES:

I noted with considerable interest your article in AUTOMOTIVE INDUSTRIES for Jan. 29, 1925, on "Art and Bodies." I agree with you that not enough study and care are given in a great many instances to body design or the execution of design. A truly good design can be utterly ruined in its execution. I could not help but notice this feature at the New York Show this year and I have been watching the various automotive magazines for some mention of this fact. Your editorial was the first that has come to my notice.

Your suggestion of employing an artist as body designer may be all right in theory, but not in actual practice, that is, if you consider the name "artist" in the generally accepted term. I have had a number of experiences with artists who were employed either in a consulting capacity, or otherwise, and in every case they failed to produce a single idea or suggestion of any importance. Judging from my experience, what is needed is not an artist, but a real body designer, or I should say car designer, as it is necessary nowadays to design a vehicle as a whole, in order to have harmony of lines in the entire car. This man may not necessarily be a mechanical engineer capable of designing motors or detailed chassis parts, but he must have a combination of mechanical skill and knowledge coupled with a certain artistic ability and sense of proportion in vehicle designing. This is usually obtained only by long practice and knowledge of body and car construction. The ability to make beautiful lines, or

pictures for magazine advertisements, is not all that is necessary to make a good body design.

Another feature that does not seem to be handled properly by some car manufacturers is the painting and trimming scheme. From the appearance of some of the cars at the show, one would judge that a painter of barber poles had been employed as chief decorator. All of these criticisms could be avoided if the work of designing, including painting and trimming, were carried out under the supervision of a good able body designer or engineer, and there are such men to be had and, in my opinion, they could be employed to great advantage and profit by some manufacturers. There is no excuse for poor design from an appearance point of view, no matter what the price of the car may be.

A. L. KNAPP,
Body Engineer, Packard Motor Car Co.

"German Silver" Radiator Shells

Editor AUTOMOTIVE INDUSTRIES:

In your issue of Jan. 15, p. 119, is an editorial on radiator shells, and, although it is not so stated definitely, it is inferred that the "white metal" shells used of late years on the majority of British cars are nickel plated.

That is not the case, however. The shells, which are integral, are actually of white-metal, sometimes called "German silver." They are white-metal all through, though I cannot say exactly what the alloy consists of; in fact, it varies with the maker. It is rather soft and tarnishes very quickly; in fact, an hour's run in the rain will cause it to become tarnished very badly. The advantage is that no matter how tarnished it becomes, it can always be cleaned and restored to its original condition by the car owner, using ordinary metal polish.

Nickel-plated radiator shells—even nickel on brass—have almost disappeared; not because they were liable to rust, for I cannot recall any maker having used nickel on steel for this purpose, but because if they were neglected for a few weeks the nickel would become cloudy or "milky" and could not be restored to its original condition.

M. W. BOURDON.

Bicentenary of Nicholas Cugnot

IN France they have been celebrating recently the bicentenary of Nicolas Joseph Cugnot, the builder of the first vehicle driven by steam, who was born at Void in Lorraine on Feb. 26, 1725.

Cugnot was a military engineer and served in the campaign in the Netherlands. Later he settled in Paris and became an army instructor. His first steam vehicle was built in 1769 and the second in 1771. Of the former comparatively little is known. Although there is evidence that it ran, the boiler was found to be of inadequate size and it also leaked, so that it was necessary to stop every 10 or 15 minutes to allow steam pressure to accumulate. A trial was made before the French Minister of War and other officials and the results were so encouraging that Cugnot was authorized to build a second machine.

While the first machine was designed as a passenger vehicle, to carry four or five persons, the second was designed to carry a load of 4-5 tons at a speed of 2½ m.p.h. This machine is still in existence and is preserved at the Conservatoire des Arts et Metiers. Copies of some documents relating to the construction of the machine are in existence also. One is a letter from a French general to the Director of the Artillery at Strasbourg, in which the cylinders and pistons are ordered. A translation of this letter, dated April 23, 1770, reads as follows:

"It is necessary that as soon as my letter reaches you, you have built at the Strasbourg Foundry two pumps of 14 in. internal length and 12 in. diameter, also inside, with two piston heads of 12 in. diameter and four lines thick, the whole in accordance with the specifications which you will find attached hereto. When these pumps and these pistons are finished you will deliver them to the representative of Mr. Bietrix, who will ship them immediately to Mr. Mazurier, storekeeper at the Paris Arsenal."

By the middle of the summer of the following year the vehicle was practically completed and the author of the above letter, Gen. Gribeauval, then wrote to the Minister of War:

"I have the honor of addressing you a memorandum to inform you regarding the state of the fire wagon of M. Cugnot, concerning which I have spoken to you. This vehicle is at the Paris Arsenal. It is sufficient to give the inventor eight days' notice when you desire to have a test made."

There is no evidence that the machine was ever tried. It remained at the Paris Arsenal for many years and in 1801 was assigned to the Conservatoire des Arts et Metiers.

Studying Rapid Motions

A STROBOSCOPIC instrument for studying rapid motions is being marketed by the Société des Etablissements Henry-Lepaute of Paris. The apparatus comprises a vibrator, a small induction coil and a flash type of neon lamp, the whole contained in a case weighing about 18 lb.

The vibrator consists of a string which is set in vibration by an electro-magnet placed opposite it and which receives its current from a battery of a few cells.

The current is interrupted by the string itself during its passage through the position of equilibrium. The contact is located immediately adjacent to its point of attachment and a stationary micrometer screw permits of adjusting this contact.

The frequency of the string may be changed in imperceptible steps by varying its tension by means of a screw fitted with a large index head, which is so calibrated that the frequency corresponding to each tension may be read off directly.

The string, which is kept in a state of vibration electrically, opens and closes the primary circuit of an induction coil, the secondary of which supplies the current required for lighting up the neon lamp. The latter is of such design that it can be readily brought close to the part to be investigated, whatever its form.

The frequency of flashing of the neon lamp corresponds exactly to the frequency of vibration of the string. This makes it possible to closely follow the movement of any piece by means of this lamp.

In connection with the manufacture of automobiles, this testing instrument may be used to study the operation of the engine valves and of the magneto interrupter, and to locate the causes of any unpleasant noises.

IT is reported from Copenhagen that a company has been organized there which will conduct automobile tours from Copenhagen to Paris next summer by means of American Yellow cabs. The trip is to be made in five days and will cost 225 Danish crowns. About 20 such trips are planned.

Customs Duties on American Motor Vehicles in Eighteen Foreign Countries

(Reprinted from *Commerce Reports*, official publication of U. S. Bureau of Foreign and Domestic Commerce)

Country importing	Customs duties given to exporting country; sales taxes and surtaxes	Operating taxes and registration fees[1]	
		Passenger cars	Trucks
Australia	Chassis assembled— *Per cent* Duty to England 7½ Duty to all other countries 12½ Chassis unassembled— Duty to England 5 Duty to all other countries 10 (Duty is assessed on component parts, whether shipped complete or not. The dutiable value is the current domestic value, which includes the cost of packing, carting, and freight to the port of departure plus 10 per cent that is added to cover ocean freight and related charges.)	$10 to $30	$9 to $114
Argentina	*Per cent* Duty to all countries 25 Surtax additional 7 (Duty is based on a list of prices in "Motor Age" plus 10 per cent converted, at the par rate of exchange.)	31 to 260	9 to 200
Canada	*Per cent* Duty to United States and other non-treaty countries 35 France, Italy and Belgium 25 United Kingdom 22½ On direct-by-sea shipments from United Kingdom 20¼ Sales tax 5 Excise tax on passenger cars: On value up to and including $1,200 5 On value in excess of $1,200 10 (Duty is assessed on wholesale market value in country of origin. Sales and excise taxes are assessed on duty-paid value.)	10 to 30	10 to 126
British South Africa	*Per cent* Duty to United Kingdom and Canada 17 all other countries 20 (Duty—on United States shipments, at least—is now being based on wholesale value to subdealers in country of origin.)	4 to 85	4 to 85
Cuba	*Per cent* Duty to United States 25.00 all other countries 31.25 (Based on wholesale value in country of origin, increased by packing and other costs incidental to preparation for shipment, but not including consular fees, insurance, and freight charges.)	12 to 63	25 to 6
Mexico	*Per cent* Duty to all countries 10 Consular invoice fee 5 (Duty based on invoice value plus expenses to point of exit.)	14 to 250	14 to 250
Japan	*Per cent* Conventional duty to United States 35 Canada, United Kingdom, France, Belgium, and Italy. (Based on current wholesale market value at the port of entry.)	39 to 304	29 to 143
United Kingdom	No duty since Aug. 1, 1924	6 to 50	6 to 50
Spain	Conventional duty to United States, United Kingdom, France, and Italy, on passenger cars and chassis weighing— *Gold pesetas (per kilo net)* Up to 800 kilos 0.75 800 to 1,200 kilos 0.90 1,200 to 1,600 kilos 1.05 1,600 to 2,000 kilos 1.20 2,000 to 2,400 kilos 1.75 More than 2,400 kilos 2.00 Trucks and truck chassis .75 (The United States enjoys the above low rates by temporary agreement until May 5, 1925. Canadian cars now pay first-column duties, which are over three times the above.)	27 to 140	21 to 224
Brazil	Duty to all countries— *Per cent* Passenger cars 34.44 Trucks 27.52 (Based on c. i. f. value at port of entry, but at the ports of Pernambuco and Sao Paulo the list price has been taken as the basis.)	9 to 45	11 to 62
Sweden	*Per cent* Duty to all countries 15 (Dutiable value is the c. i. f. value, cost of packing included.)	$9 to $64	$28 to $182
New Zealand	*Per cent* Duty to United Kingdom and Canada 10 all other countries 25 (The same basis as Australia. A primage tax of 1 per cent is collected in addition to the duty.)	2 to 5	5 to 355
British India	Duty to all countries— *Per cent* Passenger cars 30 Trucks 15 (Based on wholesale cash price, less trade discount at time and place of importation, less duties; or, the actual cost.)	5 to 43	11 to 143
Netherlands	*Per cent* Duty to all countries 5 New duty to be effective shortly 12 (Based on c. i. f. value at port of entry.)	40 to 365	No tax on vehicles used in commerce.
Philippine Islands	*Per cent* Duty to United States on direct shipments None All other countries or shipments— Trucks 15 Passenger cars 20 Parts 25 (Based on market value in country of origin plus packing and other costs incidental to the preparation for shipment.)	5 to 20	18 to 35
Italy	Duty to all countries on cars weighing— *Gold lire (per 100 kilos)* Up to 400 kilos 120 Plus 35 per cent ad valorem. 400 to 900 kilos 115 900 to 1,600 kilos 65 1,600 to 2,500 kilos 75 2,500 to 4,000 kilos 95 Over 4,000 kilos 60 *Per cent* Luxury tax (ad valorem) on passenger cars of more than 25 horsepower. (Net weight is taken as the basis of weight. Ad valorem duties are understood to be based on official values.)	12 to 174	5 to 19
Belgium	Preferential duty to the United States, United Kingdom, Canada, France, and Italy— *France (per 100 kilos)* 4,000 kilos and more 240 2,000 to 4,000 kilos— Passenger cars 640 Trucks 336 Less than 2,000 kilos— Chassis, complete without body, weighing 1,300 kilos and less 576 Chassis, complete with body, weighing 1,800 kilos and less 576 Others 640 General duty to Germany and Czechoslovakia is double the above. *Per cent* Transmission tax, collected on the declaration at time of importation 1 Luxury tax, collected at time of sale to consumer 5 (Specific duties are levied on net weight. Ad valorem duties are levied on c. i. f. value at port of entry.)	14 to 125	14 to 250
France	*Per cent* General rate, particularly to Germany 180.0 Preferential rate for the United States, United Kingdom, Canada, Italy and Belgium 45.0 Luxury tax on duty-paid value 12.0 Surtax on sales 1.3 (Basis of value is substantially c. i. f.)	9 to 141	9 to 141

[1]Conversions made into United States currency at exchange rate effective on December 31, 1924.

EDITORIAL

Future Assured

WHEN so many outside observers are worrying about the course of the automobile industry and are predicting dire things for the future, it is refreshing to find one who has done considerable investigating before going into the prophesying business. We quote the following from Jason Rogers' *Advertisers' Weekly:*

"No industry is more closely identified with advertising than the making and selling of automobiles. To advertising on a great scale the rapid development of these operations largely is due. For this reason some observers have expressed fear of unsound expansion resulting from stimulation of demand beyond the limits of reasonable renewal.

"An analysis just completed by the *Advertisers' Weekly* is calculated to dissolve these fears. The gross gains of the industry are indeed amazing. But they are no more remarkable than the automobile industry's progress to the solid footing which is enjoyed by American industry generally."

The analysis goes on to show the relatively stable position of the automotive industry as compared to other industrial enterprises. The automobile business has nothing to fear from a detailed examination of its condition.

Ravages of Corrosion

IN a statement issued by the American Society for Testing Materials to draw attention to its proposed study of corrosion phenomena, it is asserted that the total annual loss of iron and steel due to corrosion is equal to one-third of the production. It it not quite clear whether this is meant in the sense that one-third as much iron as is produced annually actually turns into iron rust each year or whether the meaning intended is that products of iron and steel equal in weight to one-third the annual production have to be junked because of damage caused by rust.

Of the iron and steel that go into automobiles certainly only an insignificant percentage is consumed by rust as long as the cars are in regular service, and if this proportion were determined it would be a poor index of the damage actually caused. In this particular field rust is harmful because it impairs the appearance of the car and because it injures bearing surfaces. Rusting of bearing surfaces ordinarily occurs only if the car is out of service for long periods of time and is kept in an atmosphere which tends to destroy the film of lubricant which covers these surfaces. Far more common are cases of damage to the outward exposed surfaces which determine the appearance of the car.

A great deal of progress has been made in the past twenty years in methods of rendering iron and steel rust-proof, and it is largely due to the introduction of these improved processes that iron and steel have replaced non-ferrous metals more and more in automotive production. The early cars had a great many parts of brass, aluminum and other non-ferrous metals and alloys, but the amount of non-ferrous metallic materials in the modern car, particularly the cheaper grades, is comparatively small.

The bulk of the actual loss of metallic iron by corrosion naturally occurs in parts of outdoor structures which are exposed to weather conditions at all times.

"Did You Know—"

IT has been said with truth that:

In 1924 87 per cent of all the automobiles built were produced by ten companies.

In 1923 87 per cent of all the automobiles built were produced by ten companies.

These figures have been cited to prove that the industry rapidly is centralizing in the hands of relatively few makers; that the bulk of the business has shifted materially from the hands of the many into the hands of the few.

But—how many people realize that almost the same situation existed ten years ago? Here is what the situation was at that time:

In 1913 the ten leading producers built 81 per cent of the total output.

In 1914 the ten leading producers built 84 per cent of the total output.

So the swing hasn't been so great, after all, despite the fact that there are fewer companies in business today than there were a few years ago.

Opinion Engineering

AN engineer came in the other day and talked about the expense of "opinion engineering." For a moment his meaning wasn't entirely clear. Then the light dawned. "Opinion engineering," this engineer said, "has been especially prevalent in body design, although its influence has been felt in chassis construction on many occasions."

Undoubtedly automotive designs from time to time have reflected too much the opinion of an engineer or an executive rather than the marketing needs of the company. More than one automobile has been built to meet the likes of the designer rather than the desires of the public.

"Opinion engineering" always was expensive; it always will be. There is less of it today than ever before and before long it should reach an irreducible minimum.

Our Industry Today—

Despite Wheat Market Collapse and Tornado, Spring Retail Sale Prospects Appear Favorable—Shortages Expected

NEW YORK, March 23—Developments in the agricultural situation have served to dampen a bit the enthusiasm with which the automobile industry has observed the steady increase, in February and March, of both production and sales. The collapse of the wheat market may be expected to affect rural business adversely, and the devastation wrought by the tornado in Illinois, Indiana and Missouri seems almost certain to curtail sales in those States just at a time when a sharp upward turn was looked for. Recent reports indicate that Pacific Coast farmers are not in such good shape as they were a year ago, and sales in the Southeast have not been as satisfactory as had been hoped.

The situation generally is much more favorable. The fine weather that has come with spring in most parts of the country has had a favorable reaction on retail sales. Basically the industry is sounder than ever before, with stocks of cars in dealers' hands low and factories gaging production in accordance with current demands. Notable advances in factory efficiency were made last year, and these will be reflected in the 1925 income of the companies. Profits per car are low, but turnover has been speeded up notably, having reached the remarkable figure of twenty times annually in some instances.

Although it appears unlikely that 1925 will be a boom year, shortages are expected to develop when the spring sales season reaches its peak. Not all the producers will be affected, however, and this should result favorably for the companies whose productive capacities will remain in excess of the demand for their cars. Thus prosperity will be spread evenly to an extent perhaps not hitherto attained.

Reports from manufacturers of parts and accessories are to the effect that replacement business is better than it was last year at this time, but sales to automobile makers are below the record of 1923.

Stutz Revises Prices on Entire Car List

INDIANAPOLIS, March 25—A revised price list has been made effective by the Stutz Motor Car Co., it is announced by R. A. Rawson, merchandising manager. The list follows:

Series	Type	List Price
Series No. 6-94	Chassis	$2,195
6-95	Chassis	2,735
Series No. 6-94	5-Pas. Phaeton	2,395
6-94	2-3 Pas Roadster	2,395
6-94	5-Pas. Sedan	3,050
6-94	4-Pas. Coupe	3,050
Series No. 6-95	5-Pas. Sportster	3,035
6-95	7-Pas. Tourster	3,070
6-95	5-Pas. Sportbrohm	3,785
6-95	7-Pas. Suburban	3,935
6-95	7-Pas. Berline	4,035

G. M. Heads See Car Industry Stabilized

Time of Big Annual Increases Past, but 1925 Should Show Moderate Gain

NEW YORK, March 25—The days of immense annual increases in automobile production and sale are definitely past, and the industry has now reached a point where only the strongly organized and capably managed corporations can expect to grow, it is declared by Pierre S. du Pont, chairman of the board, and Alfred P. Sloan, Jr., president, in their message to stockholders issued with the annual report for 1924.

A "reasonable gain" in production this year over last is predicted, and a permanently satisfactory annual business is looked for from three sources, which are described as follows:

First, from replacements. If the average lifetime of a car is six years, 2,000,000 cars must be manufactured this year to take the place of those that have rendered their service and passed on.

Second, from the normal development of the country. Population is increasing even with the present restrictions on immigration at a rate between 1 and 2 per cent a year. This, however, is not a true measure of possible growth, for wealth as well as numbers is a factor. Increase in annual income in the last ten years has been about 100 per cent. The industry should have its proper share of annual growth from the increase in national purchasing power.

Third, from exports. In 1923 the exports of cars and trucks amounted to $139,800,000; in 1924 to $158,200,000. Foreign demand has become an important factor in the industry's business and that demand will rapidly increase as good roads are developed and the economic value of the motor car is more fully recognized.

Referring to the current sales and production policy of the corporation, the message says:

During 1924 the corporation adopted a production policy as affecting stocks of finished cars which its dealers and distributors will be expected to carry. This policy is predicated upon the sale of cars to consumers as a fundamental index. Such sales are subject to seasonal fluctuations. The merchandising policy of the corporation requires that dealers and distributors shall accumulate stocks during seasons of relatively low retail deliveries in order to facilitate prompt deliveries in seasonal periods of heavy retail demand as well as to maintain manufacturing and distributing economies afforded by a reasonably level rate of production. The amount of such stock varies with the seasons of the year and is based upon a careful analysis of the trend of retail demand. No dealer is required or permitted to carry stocks beyond that point.

It is believed that the corporation in the future will be free from the evils resulting from excess accumulation of stocks involving unnecessary storage, interest and carrying charges as well as drastic curtailment of production schedules such as have occurred at times in the past.

In accordance with the above established policy sales by dealers and distributors to consumers during the year 1924 were about 70,000 cars greater than the corporation's sales to dealers and distributors. Stocks of finished cars on hand at the close of 1924 were sub-normal due to the situation of the Chevrolet Division, which reduced stocks to a minimum preparatory to the

(*Continued on page* 600)

N.A.C.C. Meets with N.A.D.A. in Detroit

DETROIT, March 25—Committees of the National Automobile Chamber of Commerce and the National Automobile Dealers Association met here this week to discuss the program of dealer meetings which the dealer association is initating. The procedure which will be adopted by the N. A. C. C. will be determined at the directors' meeting to be held next week in New York.

The N. A. C. C. committee was headed by F. J. Haynes, president of Dodge Brothers, and C. E. Gambill, president of the N. A. D. A., was chairman of his committee. General managers Alfred Reeves and C. A. Vane of the two associations, participated in the meetings.

It was stated following the conference that the proposals of the dealer organization had been received with deep interest by the manufacturers' committee and that the action of their directors would probably indicate a desire to help in dealer educational work.

Sentiment at the meeting indicated that the two associations have been drawn much closer together by the successful dealer work during the past year, and that a much clearer understanding has been established of how the two associations can participate in continued activity.

General Motors 1924 Income $45,330,887

Net Earnings $7.37 Per Share on Common Stock—Strong Cash Position

NEW YORK, March 26—Net income of $45,330,887 after depreciation, federal taxes and other charges is shown in the report of the General Motors Corporation for the year ended December 31, 1924, against $62,067,525 in 1923. The earnings, after debenture and preferred dividends were equal to $7.37 a share on the 5,161,599 shares of common stock of no par value, as compared with $10.69 in 1923.

The balance left after the debenture and preferred payments was $38,058,250, representing only such proportion of the profits of the Fisher Body Corporation and the General Motors Acceptance Corporation as was received in the form of cash dividends. The corporation's share in the undistributed earnings of these two companies was $6,292,603, which, added to the balance shown above, represents a total of $51,623,490. Surplus after common dividends was $13,058,250, as compared with $30,408,128 a year ago, and profit and loss surplus $82,110,929, against $120,699,300.

The statement reveals the corporation as in the best financial condition in its history. All purchase money mortgages have been paid, so that at the end of the year there were no notes payable or fixed indebtedness of any kind. Cash in banks at the close of the year was $88,059,016; sight drafts, $4,217,684; inventories $97,201,686; total current assets $208,179,254. Current liabilities amounted to $47,073,973, leaving an excess of current assets over current liabilities of $161,105,281. This compares with $140,740,764 as of Dec. 31, 1923, an increase of $20,364,517.

(*Continued on page* 597)

Engineers Will Meet on Tractor Problems

CHICAGO, March 26—A cooperative tractor meeting will be held at the Great Northern Hotel in Chicago, April 29 and 30, under the auspices of the American Society of Agricultural Engineers and the Society of Automotive Engineers. The program for the first day will be under the direction of the American Society of Agricultural Engineers, and on the second day the Society of Automotive Engineers will have charge.

Among the subjects of discussion are, "Influence of Tractor Engine Development on Automobile, Truck, and Gas Engine Design"; "Recent Developments in Production Methods and Equipment"; "Needed Research on Tractor Engines"; "Farm Mobile Power Equipment."

Among the speakers will be M. L. Nichols, L. B. Sperry and H. L. Horning.

G. M. C. REPORTS CURRENT ASSETS OF $208,179,253 *AND CURRENT LIABILITIES OF* $47,073,972

NEW YORK, March 25—The condensed consolidated balance sheet of the General Motors Corp. as of Dec. 31, 1924, and Dec. 31, 1923, is shown in the following statement:

ASSETS	Dec. 31, 1924	Dec. 31, 1923
Current and Working Assets:		
Cash in banks and on hand	$88,059,015.92	$47,069,804.57
Sight drafts with bills of lading attached, and C. O. D. items	4,217,684.11	13,283,706.86
Notes receivable	3,015,084.34	3,452,273.91
Accounts receivable and trade acceptances, less reserve for doubtful accounts (in 1924, $1,231,988.31; in 1923, $1,663,274.73)	13,807,434.43	15,820,019.32
Inventories at cost or market, whichever is lower	97,201,686.02	138,678,131.38
Prepaid expenses	1,878,349.04	1,587,532.94
Total Current and Working Assets	$208,179,253.86	$219,891,468.98
Fixed Assets:		
Investment in affiliated and miscellaneous companies not consolidated	$61,513,125.72	$60,805,852.53
General Motors Corporation stocks held in treasury	5,000,923.71	5,046,322.62
Real estate, plants and equipment	288,940,448.53	276,576,055.68
Deferred expenses	6,522,848.75	8,363,207.59
Goodwill, patents, etc	22,414,317.60	22,440,811.06
Total Fixed Assets	$384,391,664.31	$373,232,249.48
TOTAL ASSETS	$592,570,918.17	$593,123,718.46

LIABILITIES, RESERVES AND CAPITAL	Dec. 31, 1924	Dec. 31, 1923
Current Liabilities:		
Accounts payable	$22,974,631.06	$40,299,518.04
Notes payable	——	10,000,000.00
Taxes, payrolls and sundries accrued not due	16,994,826.94	19,430,546.06
United States and foreign income taxes	5,866,310.56	8,272,586.05
Accrued dividends on preferred and debenture stock	1,238,204.28	1,148,054.71
Total Current Liabilities	$47,073,972.84	$79,150,704.86
Purchase money mortgages	——	$1,218,055.20
Reserves:		
Depreciation of real estate, plants and equipment	$76,901,026.26	$63,248,803.25
Employees' investment fund	1,411,607.50	1,526,337.50
Sundry contingencies	14,520,350.19	7,538,435.54
Bonus to employees	899,102.43	1,914,705.69
Total Reserves	$93,732,086.38	$74,228,281.98
Capital Stock:		
Seven per cent preferred stock	$102,250,800.00	$32,931,600.00
Six per cent preferred stock	2,795,300.00	16,183,400.00
Six per cent debenture stock	4,869,900.00	60,801,000.00
Common stock no par value (1924, 5,161,599 shares; 1923, 20,646,397 shares)	258,079,950.00	206,463,970.00
Total Capital Stock	$367,995,950.00	$316,379,970.00
Interest of minority stockholders in subsidiary companies with respect to capital and surplus	1,657,979.87	1,447,406.76
Surplus	82,110,929.08	120,699,299.66
Total Capital Stock and Surplus	$451,764,858.95	$438,526,676.42
TOTAL LIABILITIES, RESERVES AND CAPITAL	$592,570,918.17	$593,123,718.46

Die Casting Subject of S. A. E. Section

Nickel Plating Also Discussed at Detroit Meeting—Molding Also Considered

DETROIT, March 23—Die casting and the plating of parts made by this process were the major topics of the production meeting of the Detroit Section of the Society of Automotive Engineers, held on March 19. The history of the art, the general discussion of the properties of die castings of various materials and their subsequent handling, along with a brief outline of the various die casting machines, were the topics covered by the paper of Marc Stern of the Doehler Die Casting Co.

Nickel plating of die castings, particularly body trim parts, was discussed briefly by B. F. Lewis of the C. B. Shepard Co., who outlined a process recently developed at the Bureau of Standards for nickel plating these alloys without a preliminary striking coat of copper or brass.

In addition to these speakers, Dan M. Avey, editor of *Foundry*, dealt briefly with the progress in the permanent molding of cast iron, both here and abroad. Permanent molding of cast iron was to have been discussed by Daniel H. Meloche of the Holley Carbureter Co., but this topic resolved into a general discussion, as Mr. Meloche was absent, having gone to Philadelphia to receive a medal from Franklin Institute for his work in this field.

Federal Trade Body Changes Procedure

WASHINGTON, March 24—A change in its rule of procedure and policy has been announced by the Federal Trade Commission which will, in a measure, affect all classes of industries, including the automotive trades. In the past it has been the policy of the commission to issue a rule, or citation, against all concerns found guilty of unfair trade practices. Hereafter, the commission announces, it shall be the policy not to entertain proceedings of alleged unfair practices where the alleged violation of law is purely private controversy redressable in the courts, "except where said practices substantially tend to suppress competition as affecting the public."

CHEVROLET AT PEAK

DETROIT, March 26—Chevrolet Motor Co. has set an April schedule of 52,000 cars, or approximately 2000 daily. This represents an increase of 7000 over the schedule for March and is approximately capacity output. Employment at all plants is now at practically peak levels.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

New York, March 25—On Monday of this week the New York Stock Exchange witnessed the most violent decline in prices since the beginning of the bull market last November. Both stock and commodity markets tended downward last week, while some gain was noted in activity in certain wholesale lines.

Car loadings in the week ended March 7 established another seasonal record, numbering 930,009 and comparing with 862,910 in the preceding week and 929,381 in the corresponding period last year. Loadings in the first ten weeks of the year were 9,000,328, or 1.6 per cent above last year's corresponding total, which was the previous high record for the season.

The final cotton ginning report, which constitutes the official estimate of last year's crop, shows a total of 13,618,751 bales, exclusive of linters. This is the largest crop since 1914, and compares with 10,139,671 bales in 1923, 9,762,069 in 1922 and 7,953,641 in 1921.

An upward trend in industrial employment in February is reported by the Department of Labor. The iron and steel industry is regarded as in a particularly favorable position in this respect, while employment in the building trades is expected to increase in coming months.

Production of bituminous coal turned upward in the week ended March 7, after a continuous decline of seven weeks. The total was 9,394,000 tons, comparing with 8,855,000 in the preceding week and 9,944,000 in the corresponding period last year.

Business failures during the week ended March 19, according to Bradstreet's, numbered 390, as against 383 in the preceding week and 392 a year earlier.

Bank debits to individual accounts reported by the Federal Reserve Board for the week ended March 18 totaled $12,415,000,000, showing a gain of 12.7 per cent over the figure for the preceding week and an increase of 22.8 per cent as compared with that for the corresponding period a year ago.

Fisher's index of wholesale commodity prices stood at 162.2 last week, comparing with 163.4 in the preceding week and 164.1 two weeks earlier. The wholesale price index of the Department of Labor for February is 160.6, as compared with 160.0 for January and 151.7 for February last year.

Discounts by Federal Reserve banks declined $70,900,000 during the week ended March 18, nearly all of the decline being in bills secured by Government obligations.

Hardy Finds Dealers Improving Methods

Olds Head, on Completing Long Trip, Reports Conditions Generally Better

LANSING, March 23—General improvement in car selling methods and in general dealer practice and administration is seen by A. B. C. Hardy, president of Olds Motor Works, as the most encouraging feature of the general automotive situation. Mr. Hardy has just completed a trip that took him to practically all sections of the country on which he studied general business conditions and the dealer situation.

Greatest improvement in general conditions was found by Mr. Hardy in the Northwest, where he said business was on a much higher plane than in the recent past, with a consequent improvement in the automobile demand. Generally speaking, he said, the best outlook for immediate business is in the rural sections, due mainly to better prices for farm products and the readiness of farmers to make purchases now.

In the eastern States Mr. Hardy found a steadying of business which is setting up a better frame of mind among wage earners. The Middle West has been consistently good throughout the poor business in many other sections and is getting better. Start of spring activities was noticeable in such States as Kansas, Iowa, Colorado and Idaho, Mr. Hardy said.

"It is not likely that any record will be broken this year in the number of automobiles manufactured and sold," Mr. Hardy added, "but it is safe to assume that dealers will work harder and be more prosperous than they were last year." It was his belief that activities of leading manufacturers in helping dealers with retail merchandising will have an important part in this general betterment.

HORNING TO ADDRESS S. A. E.

MILWAUKEE, March 23—Harry L. Horning, president of the Waukesha Motor Co. and head of the Society of Automotive Engineers, will be the guest of honor and principal speaker at the monthly meeting of the Milwaukee Section, S. A. E., on Wednesday, April 1, at the Milwaukee Athletic Club. Mr. Horning will speak on "The Lubrication of Gasoline Engines." George W. Smith of the Milwaukee plant of the Nash Motors Co., chairman of the local section, will preside.

WEDLER SHUFORD MOVES

ST. LOUIS, March 26—The Wedler Shuford Co., which manufactures the Wedford Evr-Ready inclosure for open cars on the same principle as that used in Studebaker duplex phaetons, has moved to 1116-24 South Grand Boulevard.

1924 Kelsey Wheel Income $1,118,369

Earnings Were $9.49 a Share, Against $15.84 in 1923—Sales $14,856,825

NEW YORK, March 24—The Kelsey Wheel Co. reports for 1924 net income of $1,118,369 after charges and reserves for Federal and Canadian taxes, equal after preferred dividends to $9.49 a share on the $100 par common stock (100,000 shares). This record compares with $1,758,023 or $15.84 a share in 1923.

Sales during the year were $14,856,825, as compared with $20,078,434 the previous year. Current assets as of Dec. 31, 1924, were $6,802,318 and current liabilities $775,061, leaving net working capital of $6,027,257, compared with $6,824,105 net working capital on Dec. 31, 1923. The cash position was materially improved during the last year, showing $1,387,038 at the end of the year, as against $851.974 previously.

A new item appears on the balance sheet of Government securities, which were placed at $1,018,379. Surplus for the year was $349,704, which added to the previous surplus gives a total of $8,638,926, against $8,795,538 the previous year. The slightly lower profit and loss surplus shown is the result of a deduction of $500,000 for special reserves.

A. M. A. Has Program for Foreign Trade

CHICAGO, March 24—Further advancing the organization's basic program which calls for providing its membership with real merchandising assistance, the Foreign Trade Committee of the Automotive Manufacturers' Association is at work on a plan through which it hopes to bring about material increases in foreign sales of A. M. A. members.

A partial report was made by Chairman Franklin Mayo of this committee at a meeting last night. A more complete report will be made at the next regular monthly session. The plan in a general way will be cooperative and open to all members who want to take advantage of it on a cooperative basis. It promises to set up an active foreign trade division within the association.

Especial interest attaches to this committee's activities at present because of the association's preparations to soon open a large equipment exhibit in Chicago, with a permanent sales expert in charge to represent the various companies having products on display. It is the theory of A. M. A. members that the mart not only will draw many American buyers, but that it will quickly become a logical center for foreign buyers who want to make comparisons and get prices without extensive traveling. There is no definite date set for the mart's opening, but it will be opened in the near future. April 1 will see an addition of 10 per cent on the display space charge.

G. M. Earnings

(*Continued from page* 595)

Consolidated income account for 1924 compares as follows:

	Year Ended Dec. 31, 1924	Year Ended Dec. 31, 1923
Profit from operations and investments, after expenses, but before depreciation of real estate, plants and equipment	$71,802,424.77	$91,698,666.21
Provision for depreciation of real estate, and equipment.	16,078,548.98	15,055,702.80
Net Profit from operations and investments	$55,723,875.79	$76,642,963.41
Less: Provision for:		
Employees' bonus	$ 785,615.82	$ 1,906,494.72
Amount due Managers Securities Company	1,140,189.50	1,876,119.00
Employees' savings and investment fund	1,991,989.59	1,980,583.15
Interest on notes payable	343,902.12	357,867.44
	$ 4,261,697.03	$ 6,121,064.31
	$51,462,178.76	$70,521,899.10
Less: Provision for United States and foreign income taxes	5,727,000.00	8,135,000.00
Net income	$45,735,178.76	$62,386,899.10
General Motors Corporation proportion of net income	$45,330,887.63	$62,067,525.69
7 per cent preferred stock dividends	$ 4,743,606.89	$ 2,268,161.56
6 per cent preferred stock dividends	611,380.50	971,117.00
6 per cent debenture stock dividends	1,917,649.50	3,648,092.55
	$ 7,272,636.89	$ 6,887,371.11
Amount earned on Common Stock.	$38,058,250.74	$55,180,154.58

Reserves for depreciation of real estate, plant and equipment show a net increase of $13,652,223 for the year. The total amount spent on account of additions and improvements to real estate, plant and equipment was $12,364,393. "As our plants are now well rounded out and amply capable of meeting the estimated sales demand likely to be made upon them," says the report, "there is every reason to believe that the increase in this investment during the coming year will be relatively small, as it was during 1924."

GLOBE TUBES OPENS NEW OFFICE

CHICAGO, March 26—The Globe Steel Tubes Co. of Milwaukee has opened a district sales office in St. Louis, located at 444 Frisco Building. E. C. Carroll of Milwaukee has been appointed manager of sales for that district.

Tire Output in 1925 May Be $500,000,000

Average Daily During Year of 125,000 Tires Is Forecast—Now Running 115,000

AKRON, March 25—More than $500,000,000 worth of goods will be manufactured by automobile tire factories this year in the Akron district, it is estimated by authorities in the industry, on the basis of 1924 business and the anticipated business for 1925.

Production of tires, which was approximately 100,000 a day at the close of 1924, will average close to 125,000 a day in 1925, it is forecast. Present tire production is between 115,000 and 120,000 tires a day, and the majority of rubber companies are preparing to increase their output.

Following the announcement that the Goodyear Tire & Rubber Co. had boosted its tire production schedule to 33,000 casings and 45,000 tubes a day, it is learned that the Firestone, Goodrich, Miller, General, India, and several of the smaller companies are increasing their output to meet large orders from dealers and manufacturers. Firestone is now producing more than 30,000 tires a day, Goodrich 25,000, Miller upwards of 10,000, General 3500, India 1200.

One of the most encouraging signs in the tire industry this year, as reported by the sales manager of one large company, is the fact that stocks of tires in dealers' hands are already beginning to be depleted, as a result of a rush of early spring business. Usually at this time of the year, the dealers are fairly well stocked, following the shipment of spring dating orders in large volume. The present situation is unique, however, in that the tire companies are at this early date receiving large replacement orders.

SALVAGE PLANT FOR BUICK

FLINT, March 26—Buick Motor Co. will erect a model salvage plant costing approximately $50,000 to take care of all lumber remnants, metal scrap, waste paper and left-overs generally. The plant will at first give employment to 50 or 60 men and it is the plan of the company to place older employees in this unit who are unable to continue the strain of employment in the regular manufacturing departments.

M. I. T. Offers Automotive Course

BOSTON, March 26—Massachusetts Institute of Technology is now offering a graduate course in automotive engineering leading to a degree of Master of Science. This course is in charge of Professor Charles F. Park and has started for the first time this year. It is preceded by an automotive option in the fourth year in the mechanical engineering course.

Fake Salesman of Magazines Jailed

Ashbrook Convicted of Fraudulent Sale of Class Journal Publication Subscriptions

NEW YORK, March 25—With the conviction and sentencing of Glen M. Ashbrook, alias William King, one of the most important cases in recent times involving the fraudulent sale of trade magazine subscriptions comes to an end.

Ashbrook during the period of his activity covered a large part of the eastern section of the United States, soliciting subscriptions for publications of the Class Journal and Chilton companies, including *Motor World, Motor Age* and *The Automobile Trade Journal*, as well as for other papers. The money he obtained in this way never reached the magazines, and he was never authorized to represent them.

After a long pursuit, Ashbrook was arrested in Ohio, and convicted in the State Court at Portsmouth on three charges of obtaining money under false pretenses. He was fined $75 and costs, and failing to pay them, was remanded to jail, where he will remain until he pays or the court decides that sufficient penalty has been inflicted. Ashbrook spent several months in jail while his case was pending.

Ashbrook operated under the name of the Trade Periodical Company, and it was his practice to offer as premiums with subscriptions from one to six pairs of a well-known make of overalls. These, of course, were never delivered. His arrest followed publication of a notice in *Motor Age, Motor World* and *The Automobile Trade Journal* describing his activities. Shortly afterward he solicited a subscription from a garage owner in Portsmouth and was promptly arrested. Miller & Searl, Portsmouth attorneys, represented the Class Journal Co. in the matter.

Ashbrook will be remembered by those who were approached by him as a husky, vigorous type of man whose right hand was missing, having been lost in the war, according to a story he frequently told. He is a good salesman and his victims were numerous.

STUDEBAKER AT CAPACITY

SOUTH BEND, March 24—Steady increases in production during the last six weeks have resulted in all Studebaker plants running at capacity at the present time, says A. R. Erskine, president of the Studebaker Corporation. March production of the Studebaker will total about 12,000 cars and it is expected that the second quarter will show 40,000 cars produced. Mr. Erskine stated that it is impossible to meet the demands from dealers in this country and abroad.

587,341 *CARS SOLD BY G. M. IN* 1924

NEW YORK, March 23—The General Motors Corp. reports 1924 sales to dealers by makes of cars as compared with 1923 sales as follows:

Passenger Cars	1924	1923
Buick	166,952	218,286
Cadillac	17,905	22,201
Chevrolet	295,456	464,800
Oakland	36,512	35,974
Oldsmobile	45,728	33,356
Commercial Cars		
Chevrolet	19,277	15,326
GMC Trucks	5,508	6,968
Oldsmobile	...	1,497
Totals		
Passenger Cars	562,553	774,617
Commercial Cars	24,785	23,791
Miscellaneous: includes tractors; also cars and trucks not now manufactured	3	147
Grand Total	587,341	798,555

Returned Goods Topic to Be Probed by A. E. A.

CHICAGO, March 26—In an effort to help reduce the returned goods problem, and in order to give jobbers as much information on the subject as possible, the Merchandising Committee of the Automotive Equipment Association is now conducting a survey on the subject.

After a preliminary survey in which over 50 jobbers were personally interviewed by Arthur R. Mogge, merchandising director of the A. E. A., a questionnaire was drawn up, and has been mailed to automotive wholesalers. A report to be published on the subject will cover the combined experiences of those reporting, and will also outline some of the plans or methods used by jobbers who have reduced their returned goods percentage considerably below the average.

The Harvard University Bureau of Business Research report prepared for the A. E. A. showed that from the 111 automotive jobbers who gave figures for returns and allowances that the common figure was 6 per cent of gross sales.

Returned merchandise, of course, incurs double handling and selling expense, and unfortunately is often the cause of misunderstandings betweeen dealers and jobbers.

URGE UNIFORM ROAD SIGNS

WASHINGTON, March 26—Millions of motorists using the travelled highways of the country are in constant danger of running headlong into lurking accident traps because of the lack of a uniform road-marking system for the country as a whole, declares a warning just broadcast here from the national headquarters of the A. A. A.

Expansion Planned for Selden Plant

Fabric Body Corp. to Build Fabric Bodies as Well as Trucks in Rochester

ROCHESTER, March 24—The sale of the Selden Truck Corporation of this city to the Fabric Body Corporation, of Detroit, for $450,000 last week, was the first step in a plan of expansion which calls for enlargment of the Selden plant here to include the manufacture of fabric bus bodies. The new owners plan to place on Selden bus chassis the first fabric bus bodies ever made in this country and later to manufacture these bodies at the Selden plant. This will mean enlargement of the present building or erection of a new one to care for this end of the business.

It is understood that the new company now being organized to run the plant will bear the same name as the old one. The Fabric Body Corporation will act only as a holding company, leaving the manufacture and sales of Selden trucks and buses to the new company. Organization of this company is expected to be completed by April 1, when directors and officers are scheduled to be elected. The officers of the old Selden Corporation will be retained in the new company, according to plans. They are Arthur S. More, president; William C. Barry, vice-president; S. P. Gould, secretary and E. B. Osborn, treasurer.

The Fabric Body Corporation is the largest manufacturer of fabric bodies in the world, controlling all the basic patents for this product. At present it is concentrating on passenger car bodies, but when the new company is organized here, will produce bus bodies, putting the first of these on Selden buses.

Selden at the present time is enjoying the greatest prosperity of any similar period since 1920, according to More. The business was founded many years ago, by the late George B. Selden. For a time in the early days of automobile manufacture, Selden controlled the business through his patent, receiving a royalty from every automobile manufacturer, despite the fact that he had never manufactured a car for public sale. Henry Ford stopped the flow of royalties when he refused to pay. Selden sued and built a car according to 1877 specifications to prove his patent was workable, but Ford won the suit.

A. E. A. SERVICE MEETING

CLEVELAND, March 26—A meeting for the informal discussion of the problems of automotive electric service managers will be held by the service managers of the Automotive Electric Association in the Hollenden Hotel here April 8, it is announced by Earl Turner, secretary of the association.

Dealers Better Off This Year, Says Vane

Used Car Situation Improved and Sales Stability Reached, N. A. D. A. Manager Finds

NEWARK, March 24—Greater stability was attained in the automobile dealer ranks in the last twelve months than in any other year in the history of the business, according to C. A. Vane, general manager of the National Automobile Dealers Association, who will discuss the dealer situation in the keynote address before the N. A. D. A., Sales Congress March 28 at the Robert Treat Hotel, which will be attended by approximately 1000 dealers, their salesmanagers, auditors and service managers, from New York, Pennsylvania, Delaware and New Jersey.

A powerful factor in imparting stability to the dealer industry, according to Mr. Vane, has been the method of handling the used car situation all over the country. In September of last year, for the first time in the history of the business since the "Used Car Problem" became acute, a majority of the dealers reporting to the association have been buying used automobiles for less than they are selling them for. This has been a reversal of the prior procedure. Thousands of dealer failures have been caused by over allowances on used cars.

While there was a net loss of 5000 in the dealer population of the country between September, 1923, and September, 1924, this is not a condition that need alarm the public, Mr. Vane declares. There will be even further reductions in the survivors during 1925, and it is estimated that the number of dealers could be reduced 40 per cent more, or to approximately 75,000 and the public would still be amply provided with facilities for purchasing automotive transportation.

Other factors that have contributed to the 1924 stability were the increasing demands for closed automobiles, making it a more nearly all-season business and the increase in replacement vehicles.

PEERLESS 1924 STATEMENT

NEW YORK, March 25—Peerless Motor Car Co. in its statement for 1924 reports a net loss of $1,694,178, as compared with a net income in 1923 of $706,469, which amounted to $3.09 a share on the 228,589 outstanding capital shares. Net sales for 1924 were $15,491,596.

ARGENTINE CONGRESS OCT. 3

NEW YORK, March 25—The new date for the Pan American Road Congress at Buenos Aires, originally scheduled for May, is October 3 to 13, it is announced by the Highways Committee of the National Automobile Chamber of Commerce.

FEBRUARY PRODUCTION TOTALS $287,019 CARS

WASHINGTON, March 23—February production of motor vehicles in the United States and Canada, according to the Department of Commerce, totaled 252,785 passenger cars and 34,234 trucks. The February, 1924, total was 343,444 passenger cars and 32,805 trucks, while January of this year showed 212,909 passenger cars and 28,041 trucks.

Figures for the United States alone show 242,006 passenger cars and 32,566 trucks for February as against 204,608 passenger cars and 26,501 trucks for the preceding month.

Production for last year and the first two months of 1925 in the United States and Canada, according to the latest revised figures of the department, is as follows:

	Cars	Trucks	Total
1924			
January.	293,822	30,662	324,484
February	343,444	32,805	376,249
March...	357,006	36,323	383,328
April ...	346,355	37,818	384,173
May ...	286,266	35,181	319,447
June ...	225,034	28,947	253,981
July ...	244,503	26,290	270,793
August..	255,193	28,557	283,750
Sept'ber.	263,468	31,874	295,342
October..	260,845	32,379	293,224
Nov'mber	204,316	27,820	232,136
December	182,035	27,425	209,460
Total.	3,262,307	376,081	3,638,388
1925			
January.	212,909	28,041	240,950
February	252,785	34,234	287,019
Total.	465,694	62,275	527,969

AJAX REPORTS EARNINGS

NEW YORK, March 25—Ajax Rubber Co. in its statement for 1924 reports net income of $664,128 after allowing for all charges, including reserves for depreciation and other accounts. In 1923 the company reported a deficit of $560,390. Gross sales were $16,516,715, as compared with $16,068,710 in 1923. The 1924 earnings were equal to $1.56 a share on the 425,000 shares of capital stock.

WILLYS SPEEDS PRODUCTION

TOLEDO, March 25—President John N. Willys has announced that orders from retailers of the Willys-Overland Co. were running 35 per cent ahead of the same time last year. The plant is producing more than 1000 cars per day, and it is expected that a total of 50,000 will have been made this year by the end of March.

The Chevrolet Motors Ohio Co. has taken on an increased schedule for transmissions and other parts for General Motors.

Big Sales Congress Planned for Coast

Dealers from Several States to Gather at Meetings Scheduled by N. A. D. A.

ST. LOUIS, March 25—Dealers from all parts of the Pacific Coast will gather at meetings to be held by the National Automobile Dealers Association in Los Angeles May 11-12 and San Francisco May 14-15. The program of talks and discussions, to be led by nationally known sales experts, has been laid out on a comprehensive scale, so that the coast meetings will be of major importance.

Charles E. Gambill, president of the N. A. D. A., will preside. Edward Payton of Cleveland, market analyst of the association, will talk on "Building the Retail Sales Plan," and Howard J. Wisehaupt, Cleveland sales specialist, will discuss "Applying the Sales Plan to the Prospect." Mr. Wisehaupt has just finished a 35,000 mile tour of the United States, studying the merchandising methods of 115 cities. W. D. Burruss has the topic of "How to Apply the Sales Plan to the Salesman."

The Los Angeles meeting will be held in cooperation with the Los Angeles Motor Car Dealers Association, and all southern California dealers have been asked to attend. The San Francisco meeting will be held in cooperation with the Motor Car Dealer Association of San Francisco, and will cover northern California, Oregon and Washington.

Flint Adds Sedan at $1580 to Series 40

FLINT, MICH., March 26—Flint Motor Co. is now in production on its new series B forty models and has added a sedan model in this line priced at $1,580. The price on the new touring car is $1,285, as compared with the former list of $1,075. The brougham, which completes the line, is priced at $1,620, a decrease of $20.

Lockheed hydraulic brakes are standard equipment on the new models. Body lines of the new touring model follow closely those of the Flint 55, and it is 5½ in. lower than the previous touring model. The engine in the new model is hung in a cradle similar to the mounting in the 55. Several minor changes also have been made in the engine. The gasoline tank capacity has been increased.

The new sedan is a four-door model, upholstered in wool cloth and is equipped with built-in vanity case and smoking set. It has a heater, robe rail, foot rest and one-piece windshield. Several changes have been made in the brougham, including the provision of a larger trunk rack. Touring and sedan models are finished in blue Duco, and the brougham in varnish. All models carry front bumpers and spare tire.

"Service at Profit" Slogan at Detroit

Maintenance Show to Give Elements of Profitable Repair Shop Operation

NEW YORK, March 25—The latest in repair shop facilities will be shown the automotive trade at the Second Annual Automotive Service Convention and Automotive Equipment Maintenance Show to be held in Detroit in the General Motors Building May 20-23.

"Service at a Profit" will be the slogan and all of the addresses and papers at the convention will bear on the three elements bearing on economical operation—the selection of the right men, methods and materials.

"The personnel of a shop," says the Convention announcement, "must be competent from the management to the mechanic; policies must be such that attract trade, and the processes such as to insure satisfactory work in a minimum time, so that prices charged the customer may meet competition. Owners of cars and trucks are becoming more and more astute in buying their repairs, which is fortunate for both the industry and users."

Both the convention and show will be in charge of the National Automobile Chamber of Commerce assisted by the Society of Automotive Engineers, Motor and Accessory Manufacturers' Association, National Automobile Dealers' Association, Automotive Equipment Association, Automotive Electric Association and Automotive Manufacturers' Association.

Alvan Macauley, chairman of the Service Committee of the National Automobile Chamber of Commerce, will preside at the convention and the show will be handled as before by S. A. Miles, who has managed the automobile shows in New York and Chicago for the past twenty-five years.

SERVICE TOOL CORP. MOVES

NEWARK, March 26—The Service Tool Corp., manufacturer of milled teeth files, has just moved its main office and plant from Newark to Latrobe, Pa. A Detroit branch office and warehouse has been established in connection with the warehouse of the Vanadium Alloys Steel Co., located at 5219 Trumbull Avenue, Detroit.

CONTROLLER CO. EXPANDS

MILWAUKEE, March 23—To double its productive capacity the Industrial Controller Co., Milwaukee, has purchased the three-story building, 100 by 400 ft., of the Riverside Printing Co. at Hanover and South Pierce Streets, and will begin work at once on a two-story addition. The plant is designed for seven or eight floors. The Industrial shops at 866 Greenbush Street have been placed on the market. The concern is widely known in the automotive industries for its electric controlling devices for all classes of machinery. Charles Gale Welch is president and Francis W. Magin secretary.

South Africa to See Straight Eights Soon

JOHANNESBURG, SOUTH AFRICA, Feb. 25—(*by mail*)—Straight-eights will soon be on sale here for the first time, and there is a great deal of speculation as to whether they will "take on." The prevailing opinion is that they will, for although many persons for reasons of economy would like the smaller, less powerful cars, power is essential in this country, with its high hills, long distances and bad roads. It is hoped that the eight-in-line cars will be here in time for the motor exhibition to be held toward the end of March and early in April.

Word from East and Central Africa is that roads are being extended into regions hitherto inaccessible. One of the new roads is from Nairobi to Lake Nyasa. This means a great deal for the motor business of the dark continent, and automobile men are losing no opportunity to point out that only through the extension of communications and transportation can Equatorial Africa attain a proper stage of commercial development.

NEW BRANCH FOR CHEVROLET

DETROIT, March 23—Chevrolet Motor Co. will make Minneapolis its permanent northwestern headquarters and will erect a $100,000 building in which will be located display rooms, offices, parts departments and warehousing space. Territory included in the jurisdiction of the branch will be Minnesota, the Dakotas, Montana, northern Iowa and western Wisconsin. The new headquarters will be ready for occupancy about July 1.

G. M. HEADS' STATEMENT

(*Continued from page* 594)

introduction of the new Chevrolet on Jan. 1, 1925. Had the productions policy of 1923 been in effect in 1924 the corporation's sales would have been about 70,000 cars greater with substantial increases in net profit for that year.

It has been, and undoubtedly will continue to be the policy of the industry to share the economies flowing from increased production with the purchaser through either lowered sales prices or betterment in quality, or both. At times such economies have been anticipated and sales prices established that could only be justified by greatly increased volume. The time has come, however, when any great increase of volume must be gained not from additional reservoirs of new buyers or new markets unworked by other manufacturers, but on the contrary, from well-exploited markets intensely cultivated by all manufacturers. Under such circumstances price reductions in the future face entirely different conditions from those which have prevailed in the past.

Big Business Seen by Autolite Company

President Miniger Reports March Production 40,000—April Schedule 25% Greater

TOLEDO, March 24—That the first six months of the present year will be better than the entire year of 1924 was the report made to stockholders yesterday at the annual meeting of the Electric Autolite Co. by President C. O. Miniger. He declared that March business was the largest since August, 1923, and that considerable new business was being booked.

"Since the first of the year we have taken on some new contracts with Ajax, Nash and Gray," said Mr. Miniger, "and are negotiating some other new business which will practically guarantee a normal run of production for the last six months of the year. This picture in 1925 is a decided change from what it was last year in the whole automotive industry. Most of our customers today are actually short of cars. Stability for the rest of the year seems to be the attitude of manufacturers and dealers.

"Production in March was about 40,000 starting and lighting units and in April schedules call for an increase of about 25 per cent."

Officers reelected at the meeting besides Mr. Miniger were A. E. Buchenberg, vice president; J. H. Householder, treasurer, and Frank H. Landwehr, secretary. The treasurer's report showed that the entire $3,000,000 of first mortgage bonds had been retired during the period from July 17, 1922, when the company started, to December 31, 1924.

Ford Officials Leave Canada for Australia

FORD CITY, ONT., March 23—Members of the executive staff of Ford Motor Co. of Canada, Ltd., who will become attached to the new Ford Motor Co. of Australia, Ltd., left here on the first step of their journey, and will sail shortly from Vancouver. In the party were L. W. Lee, assistant superintendent of the home plant; H. Edney, sales manager from Montreal; J. H. A. Pilgrim, sales analyst, Montreal, and T. F. Lamb, assistant manager of the Toronto branch.

The work of completing plans for the Australian subsidiary have been carried actively forward and announcement of the locations of the five car assembly plants and the body plant is expected to be made known within a short time. Hubert C. French, who will be general manager of the Australian subsidiary, and Philip W. Grandjean, secretary of the Canadian corporation, have been in charge of the party making the arrangements for the Australian plants.

World Survey Begun on Bus Development

Automotive Division Undertakes Securing Information from 35 Countries

WASHINGTON, March 25—A survey of bus transportation in all parts of the world is under way under the guidance of the Automotive Division of the Department of Commerce with Chief Percy Owen in charge.

To secure the latest and most complete information available, questionnaires have been sent to offices of the department in 35 foreign countries. First replies are expected in this city by the middle of April, and the work of informing the American automotive industry of bus development abroad will then begin.

In the opinion of Chief Owen, this investigation is an important undertaking. In a letter sent with the questionnaire to the foreign offices he outlined the phenomenal growth of bus transportation in the United States in recent years, and explained the importance of the survey being undertaken by the Automotive Division.

Based upon replies to the questionnaire, special bulletins will be issued by the Automotive Division, both in mimeographed and printed form, and other publicity channels will be used to broadcast the information received. The subjects covered include: Development of use of buses; number and location of lines and machines in operation, or contemplated; types of machines in use, with details as to construction; lists of individual makes, with preference and prices; laws and regulations affecting bus-operation; methods of merchandising, and specific sales opportunities.

BRITISH CYCLE SHOW SEPT. 21

LONDON, March 11 (*by mail*)—The 1925 annual cycle and motorcycle show is to be held again this year at the Olympia from Sept. 21 to 26, it was announced by the British Cycle & Motorcycle Manufacturers & Traders Union, Ltd. The opening date is considerably earlier than has been the usual custom, it being felt that the requirements of the trade will be more generally met by the new arrangement.

BRASHEARS ELECTED CHAIRMAN

WASHINGTON, March 25—New officers for 1925 were elected here this week at the annual meeting of the advisory board of the District of Columbia division of the American Automobile Association and a general program of expansion adopted.

Edward Brashears was elected chairman of the advisory board, to succeed Dr. Frederick V. Coville of the Department of Agriculture, who is to be out of the city for an extended period. One of the important questions raised at the meeting was the use that the money collected from the gasoline tax in Washington should be put to. This question was discussed in connection with the projects for resurfacing the streets of Washington, a matter in which motorists are vitally interested.

Start California Gasoline Price War

SAN FRANCISCO, March 26—Keen competition in the sale of gasoline resulting from the large number of new concerns entering the retail field, brought on March 18 a reduction in price to 19 cents a gallon, including the state tax of two cents a gallon. Shell, Union, General Petroleum and Richfield announced the cut, while the Associated and the Standard of California were understood to be preparing to meet it, and, if necessary, do some further cutting themselves.

Conference of sales department officials of these six companies on March 17 resulted in failure to agree on a common price, and the slash was announced the following morning. The Union Oil Company made a similar reduction on the same date in Oregon, putting the price at 20 cents, including the three-cent state tax. This puts the price of the gasoline at 17 cents, the same net figure as that to which it was cut in California.

APPOINT TRAFFIC DIRECTOR

WASHINGTON, March 24—M. O. Eldridge, research specialist of the American Automobile Association, was appointed Director of Traffic of this city this week by the District Commissioners. This office was created in the model traffic law enacted by Congress for the District and it is vested with liberal authority. His first task will be the establishment of a speed limit for Washington. A recommendation on speed must be made before May 2, the date the major provisions of the traffic law become effective.

MILES LEAVING FOR EUROPE

NEW YORK, March 25—S. A. Miles, show manager of the National Automobile Chamber of Commerce, is booked to sail for Europe this Saturday. Whereas in former years his annual trip has been mostly for pleasure, it is expected that the foreign activities of the N. A. C. C. will occupy part of his time while on the Continent and in Great Britain.

MOHAWK ADDS TO PLANT

AKRON, March 26—President S. S. Miller announces that the Mohawk Rubber Co. will build a $60,000 addition to the plant on Second Avenue. Mohawk earned $343,656 last year on sales of $3,413,731. Present production at the plant is approximately 1200 tires a day.

Patent Office Shift to Help Car Makers

Hoover Outlines Changes Planned as Activities Are Brought Under Commerce Dept.

WASHINGTON, March 25—Transfer of the jurisdiction of the U. S. Patent Office from the Interior Department to the Department of Commerce, under Secretary Hoover, has been made by the President and marks the first initial step in the Office's reorganization which is being studied by a Committee, named by the President and headed by A. J. Brosseau, of the National Automobile Chamber of Commerce and a member of that organization's Patents Committee.

Inclusion of the Patent Office in the Commerce Department, according to Secretary Hoover, will make for a much smoother handling of the international phase of the patent problem which is now coming prominently to the fore. He declares that patents occupy an important position in the country's foreign trade situation and that one of the leading industries' interest at stake is the automotive and accessories manufacturers. Speaking of anticipated changes, which will ultimately benefit the automobile industry, Secretary Hoover says:

> "At the present time an American patentee is required in many foreign countries to manufacture continuously in those countries under his patent or else lose his patent rights. We make no such requirements in the United States. The consequence is that inventors and our manufacturers, such as automotive, in order to protect their inventions have been driven to the establishment of a large number of factories abroad, whereas foreign patentees have been able to use their patents in the United States actually to prevent manufacture here. This is one of the things we expect to remedy."

There is to be an international convention for the protection of industrial property at The Hague on Oct. 8, 1925, at which the American Government is to be represented and where proposals will be made for the equitable and equal treatment of patentees in all countries.

NO HAWKEYE REORGANIZATION

DES MOINES, March 23—Failure of stockholders of the defunct Hawkeye Tire & Rubber Co. to reorganize and raise a $40,000 working capital fund means that this factory and equipment, valued at $165,000, will be idle. Efforts to launch the new organization scheme have apparently been fruitless, and the leaders of the movement surrendered their option this week when stockholders failed to show interest in the project. About half the necessary fund was volunteered.

Fageol Motors Show Gain in 1924 Report

Net After Dividends $450,000—Plant and Distributing Organization Being Extended

OAKLAND, March 26—One of the subjects of outstanding discussion in financial circles at the end of March was the annual report of the Fageol Motors Company, of Oakland, which has had a very rapid growth during the past two years. The annual report shows a net profit for 1924 of approximately $450,000, after the company had paid its regular 7 per cent dividend. Gross earnings for the year ending Dec. 31, 1924, were $4,390,000 from which the company added approximately $300,000 to its surplus, bringing the assets to a total of $2,000,000, a gain of rather more than $750,000 for the year over 1923.

The corporation is not paying dividends on its common stock, and did not pay them on the preferred during the slack years after the war, but last year it paid all the accumulated dividends on the preferred, and announces that it soon will put the common on a dividend basis. The company has $831,000 of preferred outstanding and $1,928,000 of common. Stock is to be listed at book value.

Two New Units Completed

The Fageol company has completed two of five new units being added to its plant here, and work is proceeding on the other three which are to be completed by May 1, 1925. This improvement will increase the output of the corporation to 70 coaches and 40 trucks monthly, or about double present capacity. Each of the new units is 50 x 100 feet in size.

The Fageol Motor Sales Corporation has been organized within the past month, as a subsidiary to the Fageol Motors Company, for handling the distribution and merchandising of Fageol buses and motor trucks. The first branch of this corporation was opened in Seattle early in March, and others are to be established in various sections of this country and in other countries as well. One of the officials of the sales corporation left San Francisco recently for Australia to organize a distributing agency there.

ROBLE WITH EATON AXLE

CLEVELAND, March 26—The directorate of the Eaton Axle Co. has been reduced from eleven to seven members. President J. O. Eaton said that business was continuing very satisfactory and that earnings in January and February were far ahead of those in the corresponding months a year ago. The new board of directors elected includes J. O. Eaton, C. I. Oches, A. D. Brooks, E. B. Greene, W. Forbes Morgan, T. M. Cox and C. E. Briggs.

FORD SPEEDS OUTPUT TO 7,000 CARS DAILY

DETROIT, March 26—Ford production has been increased to 7000 cars and trucks daily, the present operation representing an increase of about 600 units a day over the schedule of the early month. Rapidly increasing demand for cars is shown in reports received from dealers and branches in all parts of the country. There are practically no dealer stocks. Tractor production has been moved up to 450 a day to care for growing demands, the company says.

Fred C. Roble, formerly with General Motors, has been appointed assistant to President Eaton. He also has been elected a vice-president of the company. Roble recently resigned from the General Motors advisory staff. He had also been with the Ford Motor Co. for six years in various manufacturing capacities. Roble carried on the appraisal and adjustment work which resulted in a prompt settlement by the Government of war claims for war work and permitted the Ford company to return to building cars and trucks.

KISSEL PLANT ACTIVE

HARTFORD, March 26—Greatly increased activity is under way at the factory of the Kissel Motor Car Co. in order to meet the spring demand for the new six and eight-cylinder Kissel cars. At the Indianapolis show the Kissel dealer sold four times as many cars as in any previous show in that city. Several changes are being made at the factory for the purpose of increasing production. A new Duco finish drying room is being constructed and the finished bodies are being rerouted to expedite delivery to the upholstering department.

WISCONSIN PASSES 2c. GAS TAX

MILWAUKEE, March 23—A 2-cent tax on gasoline is probably the most important feature of the new highway law enacted by the Wisconsin Legislature and just signed by the governor. The law is expected to provide a highway fund of $15,000,000 annually for the next biennium. The system of taxing cars by weight effected on Jan. 1, 1922, is continued, and this is estimated to produce a revenue of $8,120,000 in the coming year. The gasoline tax is counted upon to provide $4,880,000 additional per year, and federal aid will amount to $2,000,000.

LARRABEE-DEYO JOINS N. A. C. C.

NEW YORK, March 26—The Larrabee-Deyo Motor Truck Company of Binghamton, N. Y., has been elected to membership in the National Automobile Chamber of Commerce.

Bosch Magneto Shows Sales Gain for 1924

Net Sales $10,467,308, Against $10,081,439 in 1923—Earnings 77 Cents Share

NEW YORK, March 25—The report of the American Bosch Magneto Co. for 1924 shows an increase in net sales, profits and surplus over 1923. Net profit after charges was $107,626, equal to 77 cents a share on 138,266 shares of no par common stock. This compares with $94,075, or 97 cents a share, on 96,000 shares outstanding in 1923. The increased number of shares in 1924 is due to the merger with Gray & Davis, Inc., through an exchange of securities.

Net sales were $10,467,308 in 1924 as against $10,081,439 the previous year. Current assets, as shown in the balance sheet for Dec. 31, 1924, were about three times current liabilities.

In his remarks to stockholders, Arthur T. Murray, president, says that production of radio devices, including battery eliminators, will be extended during the year and should mean profitable business for the company. Regarding the automotive situation he says:

> From the standpoint of sales to automobile manufacturers, your company felt the sharp recession of demand which started the latter part of March in the automobile industry generally, and there was no marked pick-up until the fall months. Competition, so far as the equipment sold to automobile manufacturers was concerned, was and still is extremely keen, and the margin of profit is very small.
>
> During the fall months the merger with Gray & Davis Co. was completed. We are just beginning to get the benefit of the manufacturing economies made possible by the merger. The benefits of these economies should be felt the current year.

ADAMS AXLE AT SYRACUSE

SYRACUSE, March 24—Closing of the Findlay, Ohio, plant of the Adams Axle Co. will be completed next month. The removal of the plant to this city is about 80 per cent complete now and more than 500 men are now on the payroll at the local plant.

When the local plant is at capacity it will employ approximately 750 men in the manufacture of axles for all the Durant cars. The Durant interests have control of the New Process Gear Co. here, which makes gears for the various Durant cars. A. A. Heninger, vice-president and general manager of the New Process Gear Co., holds the same positions in the Adams Axle Co.

ORGANIZE NEW COIL COMPANY

TOLEDO, March 25—The Mallory Electric Corp. has been organized, with offices in the Factories Building, Toledo, to manufacture and sell Mallory ignition coils and other products.

Men of the Industry and What They Are Doing

Rice Reports Better Business

H. H. Rice, president of Cadillac Motor Car Co., has just completed two business trips, on one of which he visited the Pacific Coast and Southwest territory, and on the other the New England and industrial eastern section. He reports a confident tone to business generally in these sections, with better business already evident at many points. Automobile buying will be greatly benefited as result of this business stimulation, he said.

Gilbert and Edgar with Oakland

E. R. Gilbert and L. M. Edgar have been appointed field representatives of the Oakland Motor Car Co. in the Minneapolis district. Gilbert was formerly a field representative in the St. Louis district for Dodge Bros. and for the last three years has been manager of the Minneapolis territory for Maxwell-Chrysler. Edgar, also a former Dodge Bros. field man, has lately been Minneapolis manager for Hupp Motor Car Co.

Cobb Resigns from Maccar

W. E. Cobb has resigned as general sales manager of Maccar Truck Co. It is not known what his plans are for the future. In the eighteen years he has been in the automobile industry he has been connected with Master Truck Co. as Eastern sales manager and president of the New York branch; with the Locomobile Co. of America, Inc.; with Simplex Motor Car Co., National Motor Car Co. and Polk Manufacturing Co.

Janda Receives Appointment

H. F. Janda recently received the appointment of assistant director of the Highway Research Board of the National Research Council. He was for two years assistant city engineer at Portage, Wis., became assistant professor of civil engineering at the University of Cincinnati and associate professor of highway engineering at the University of North Carolina.

Parrill Goes to Coast

Frank L. Parrill has joined the staff of Hammel Sutphen & Co., Inc., national advertising agency, Los Angeles. He has been sales promotion manager of the Prest-O-Lite Co., and has been on the merchandising and advertising staff of the Chilton Co., Philadelphia. Following that he was advertising manager of the Cole Motor Car Co. and with the Homer McKee Advertising Co.

Louden Goes with Oakland

W. H. Louden has been appointed manager of the Memphis district for Oakland Motor Car Co., the territory including Mississippi, Arkansas, western Tennessee and parts of Texas and Alabama. He has been connected with the sales department of Dodge Bros. for six years, his last post being field representative in the Indianapolis and Detroit districts.

Swayne Sails for Europe

Among the passengers on the SS. Olympic sailing Saturday is Alfred H. Swayne, vice-president of General Motors, who will visit England, Belgium, Denmark, Germany and France to look into the interests of the corporation in Europe, and to make a study of the financial situation overseas.

Gillespie Joins Wollmar Staff

A. J. Gillespie is now representing the Wollmar Engineering Corp. in the Cleveland territory, in charge of sales of NKA ball and disc bearings. He was formerly district manager for Hess-Bright and SKF, and has recently been president of the A. J. Gillespie Co.

Anderson Resumes Managership

Harry W. Anderson will resume his position as Eastern sales manager for the Stutz Motor Car Co. of America, Inc. He has been for some time temporarily in charge of the reorganization of the New York branch.

Petty Takes Maccar Designing

Walter M. Petty has been appointed designing engineer for the Maccar Truck Co. Previous to his connection with this company he was associated with Mack Bros. Motor Car Co. and the Service Motor Truck Co.

Bare Now American Engineer

Erwin L. Bare is now connected with the American Body Co. as chief engineer. He was formerly with J. C. Widman, and, more recently, with the C. R. Wilson Body Co., prior to the merging.

Headington Signs with Stutz

E. W. Headington has been appointed manager of the New York factory branch of the Stutz Motor Car Co. of America, Inc. He has been New York Haynes representative since 1905.

Hufstadter Joins Dodge

William Hufstadter, formerly general sales manager of the Mason Truck Co., has joined the Graham Bros. division of Dodge Bros. and will take over the Minneapolis territory.

Korshin Represents Whitney

M. R. Korshin is now special representative of the Whitney Manufacturing Co., Hartford, Conn. He was formerly sales representative for the Arrow Head Steel Products Co.

Webb Takes Rickenbacker Post

A. C. Webb has been appointed Eastern sales manager for the Rickenbacker Motor Co., with headquarters at 1777 Broadway.

Witt Resigns from Flint

Frank E. Witt has resigned as general sales manager of the Flint Motor Co. His plans for the future have not been announced.

France Offers Cash Prizes for Aviation

PARIS, March 19 (*By Mail*)—Government premiums to the builders of airplanes and engines capturing world's records will be continued for 1925, according to a statement from the office of the Under Secretary of State for Aviation. These premiums were established in March, 1924, and have already resulted in a number of records formerly held by American machines being returned to France.

If the world's speed record at the end of December, 1925, is held by a French machine, its maker will be entitled to a government subsidy of 140,000 francs (over $7,000) and the maker of the engine will receive $3,000. The builder of a flying boat which captures the world's speed record for France will receive $5,000 and the maker of the engine $2,500. The world's distance record without fuel replenishing entitles the manufacturer to a premium of $2,500, plus an equal amount if the duration record is obtained at the same time. The maker of the engine equipping this machine will be entitled to a subsidy of $1,000 for the time record. Substantial amounts are also offered for the international altitude records and for the Beaumont cup.

The Panhard-Lavassor Knight type engine which was entered in the government tests for commercial motors has completed its preliminary trials and is now to undergo a 240-hour bench test in periods of eight hours. No machine has yet succeeded in accomplishing the entire series of tryouts for the 2,000,000 francs in prizes.

START ECONOMIC SURVEY

CHICAGO, March 24—Three Illinois towns, Dixon, Rochelle and Sycamore, with their surrounding rural districts, have been selected for an intensive survey intended to reveal the economic social and civic problems of the average American community. Stress will be laid upon retail questions, but the survey will go further and endeavor to lay bare every element conducive to the wholesome development of the community. The National Association of Retail Clothiers and Furnishers initiated the movement, which is being assisted by the Retailers' National Council, comprising twelve of the leading retail associations of the country.

Meloche Receives Engineering Award

Longstreth Medal Goes to Holley Carbureter Expert for Improvement in Molds

DETROIT, March 24—Daniel H. Meloche, metallurgist with the Holley Carbureter Company of this city, was awarded the Edward Longstreth Medal by Franklin Institute of Philadelphia on March 19. This medal, which is awarded for the encouragement of invention and recognition of meritorious work in science and the industrial arts, was presented to Mr. Meloche in accordance with the certificate presented at the same time for "Improved Methods of Making Long Life Molds."

Mr. Meloche devised and perfected the process of pouring cast iron into permanent metal molds which is now used at the Holley plant. At present piston castings, hydraulic brake cylinders, carbureter bodies and a variety of other parts are in production. A cast iron mold is coated with a refractory material and, as a part of the process, with amorphous carbon, and several molds are mounted on a continuously rotating turntable. The finished casting is free from the scale which is characteristic of sand molded castings and has a very uniform structure that is free from blowholes. At the Ford plant 25,000 piston castings have been produced in one die before renewal was required.

Youngest Recipient

This is the first time that the Longstreth medal has been awarded for developments in foundry practice and the award is doubly noteworthy in that Mr. Meloche is the youngest recipient of the medal. Since the foundation of the Longstreth medal in 1890 about one hundred awards have been made. Major Hoke of Pratt & Whitney received a similar award recently for his gaging system. Among other well-known recipients are Thomas A. Edison, the award being made in 1899 for Rail Bonds and Electrical Contacts. A similar award for the automatic pistol was made to the Colt Patent Fire Arms Manufacturing Co. in 1906.

Other awards of particular interest to the automotive industry are James Hartness, president of Jones & Lamson, for the Screw Thread Comparator in 1922; Henry F. Eberhardt and Ulrich Eberhardt for the radial gang cutter in 1904; Christian H. Baush for the radial drilling machine in 1894.

TO STUDY RUST PREVENTION

PHILADELPHIA, March 25—With the aid of several national organizations, which raised a fund of $70,000 and also offered to provide factory space and labor, the American Society for Testing Material will start immediately upon a study of the factors influencing the rusting of iron and steel. The announcement was made at a recent meeting attended by about 200 delegates, in the course of which it was proposed to establish stations in different parts of the country where exposure tests can be made under all climatic conditions. It is planned to have stations at Key West, Sandy Hook, the Federal Bureau of Mines at Pittsburgh, the Pennsylvania plant at Altoona and the Pennsylvania State College.

The committee also pointed out that the world's production of iron and steel in 1922 aggregated 66,000,000 tons and that the loss through corrosion was about 33 1/3 per cent, while the loss through actual wearing out of this material was placed at 17,000,000 tons.

Open Display Center for Manufacturers

NEW YORK, March 25—The Clucker & Hixson Co. has established complete merchandising facilities at 47 Murray Street, New York, which provides not only desk room but stock space and display facilities for automotive manufacturers which may be attended by either salesmen of this firm or of the firms represented.

The following manufacturers are now represented in New York through this organization: Perfection Gear Co., Chicago; Frank Rose Mfg. Co., Hastings; Lawrence A. Sweet Manufacturers, Los Angeles; Kay-Bee Mfg. Co., Los Angeles; Fostoria Screw Co., Fostoria, Ohio; General Piston Ring Co., Tipton, Ind.; National Cork Products, Newark, and Ringleader Mfg. Co., Richmond, Ind.

WHEELER-SCHEBLER EXPANDS

INDIANAPOLIS, March 25—Night shifts were this week added to several departments in the plant of Wheeler-Schebler Carbureter Co., which will bring production to the highest point in recent times. The new model Schebler S carbureter and the increasing demand for it by passenger car companies which have adopted it during the last year is the immediate cause of the increased employment. Carload shipments to motor car plants are being made regularly and the entire plant is running at capacity with several night shifts.

ORDERS AJAX PARTS

RACINE, March 23—Nine Racine industrial plants have been given contracts by the Ajax Motors Co. of Racine for materials and supplies entering into the new Ajax car, production of which is expected to start early in April. The contractors include the Modine Manufacturing Co., radiators; Harvey Spring & Forging Co., springs; Belle City Malleable Iron Co., Standard Foundry Co., J. I. Case T. M. Co., Armstrong Foundry Co. and Racine Brass & Iron Co., steel, malleable, gray iron, brass and aluminum castings; Wisconsin Metal Products Co., stampings; F. J. Greene Engineering Co., miscellaneous.

FINANCIAL NOTES

General Motors Corp. has just completed the distribution of 31,479 shares of new common stock and 2553 shares of 7 per cent preferred stock of the corporation to 3492 of its employees. This distribution represents the accrued portions of the employees' bonus credited to Dec. 31, 1924, on awards granted for the years 1919 to 1923, inclusive, and also covers the first one-fourth of awards granted for the year 1924. The approximate value of the securities which have just been distributed exceeds $2,600,000 at current market prices.

Goodyear Tire & Rubber Co. has designated by lot $750,000 in first mortgage 20-year 8 per cent sinking fund gold bonds for redemption May 1, 1925. Dillon, Read & Co., New York, are sinking fund agents. The bonds designated for redemption are payable at the Union Trust Co., Cleveland, or at the Central Union Trust Co., New York, at 120 and interest to May 1.

Seagrave Corporation of Columbus, Ohio, manufacturer of motor driven fire apparatus, declared an initial quarterly dividend of 1¾ per cent on the preferred stock, payable April 1 to holders of record March 20, and an initial quarterly dividend of 30 cents a share or 2½ per cent on the common stock, payable April 20 to stock of record March 20.

C. G. Spring & Bumper Co. shows in balance sheet for Dec. 31, 1924, current assets of $729,771, and $485,128 current liabilities. Cash amounted to $49,992. Net income for the first five months of current fiscal year is reported as $46,580, compared with practically none for the same period in the 1923-24 year.

Ames Holden Tire Co. of Kitchener, Ont., for 1924 reports a deficit of $11,453, as compared with a deficit of $13,548 in 1923. Bank loans were paid off during the year and there was an improvement in sales, working capital and general financial condition.

Ford Motor Co. of Canada.—In the Supreme Court in Brooklyn, N. Y., a temporary injunction was issued restraining Philip L. Wing and Marshall & Co. from selling the so-called "bankers' shares" of the Ford Motor Co. of Canada.

Blake Piston Ring Co., Canton, Ohio, has filed papers with the secretary of State increasing the capital stock from 1000 to 2000 shares of no par value. The company proposes improvements and enlargements.

Elyria Iron & Steel Co., Elyria, Ohio, producer of automotive steel, have reelected officers as follows: President, Hugh B. Wick; vice-president, M. A. Wick; secreary and treasurer, George F. White.

United States Rubber Co.—The National Bank of Commerce, New York, has been appointed trustee of this company's $30,000,000 6½ per cent serial gold notes, due March 1, 1940.

Pierce-Arrow Finance Corporation for 1924 shows gross income of $197,495, net income of $37,194, and as of Dec. 31 current assets of $482,727 and current liabilities of $10,046.

Old Reliable Motor & Truck Corporation's assets are to be sold by court order April 1 at the company's plant, Marion Street, Long Island City, New York.

Curtiss Aeroplane & Motor Co. has increased directorate to eleven members by the election of R. C. Tripp and A. A. Schlessinger.

Chemists to Discuss Industry's Problems

Meeting of American Chemical Society to Be Devoted to Automotive Research

BALTIMORE, March 25 — Research progress in the automobile industry will be the theme of addresses to be delivered before the American Chemical Society in Baltimore, April 6 to 11. Before the Petroleum Division, Ronald Reamer, petroleum research chemist of Poughkeepsie, N. Y., will discuss "Dilution of Crank Case Oil in Automobiles."

"One of the difficulties in properly lubricating auto engines today," says the announcement of the Division, "lies in the fact that some of the gasoline condenses before it explodes in the cylinders and goes down into the crank case and dilutes the lubricating oil, thereby making it less effective."

Other speakers before this Division will include: Dr. Benjamin T. Brooks, New York; R. H. Brownlee, Pittsburgh; Jacque C. Morrell, Riverside, Ill.; Reston Stevenson, associate professor of chemistry in the College of the City of New York; Ford H. McBerty, Poughkeepsie, N. Y.; G. L. Oliensis, Madison, Ill.; J. E. Babb, Pittsburgh; R. E. Wilson, Whiting, Ind.; Prof. A. E. Wood, Mississippi College, Clinton, Miss.; A. P. Bjerregaard, Okmulgee, Okla.; W. B. Dillingham, Baltimore; A. G. Peterkin, Jr., Philadelphia; J. B. Hill, Philadelphia; P. K. Porter, University of Pittsburgh; Prof. Cecil E. Boord, Ohio State University; T. H. Rogers, Whiting, Ind.

Results of a study of automobile finishing varnishes will be made public by Prof. W. T. Pearce of the North Dakota Agricultural College.

Laboratory Men Will Talk

Representatives of leading laboratories will address the Rubber Division, which has scheduled a symposium for April 9 at Johns Hopkins University. Among those who will speak are: H. R. Thies, Akron, Ohio; John T. Blake, Cambridge, Mass.; R. B. Stringfield, Akron; L. B. Sebrell, Akron; Ellwood B. Spear, Pittsburgh; W. B. Wiegand, Kitchener, Ontario, Canada; Henry Green, Palmerton, Pa.; S. E. Sheppard, Rochester; R. P. Dinsmore, Akron.

At the opening session of the Division of Industrial and Engineering Chemistry on April 7, Thomas Midgely, Jr., of the General Motors Research Corporation, Dayton, will deal with progress in the manufacture of tetra-ethyl-lead, now an important factor in gasoline utility.

BUILDING BOOMS IN SOUTH

ATLANTA, March 24—The automotive industries in the southern States continued during February to maintain the remarkable record established in January in new construction, including for the most part new garages and new buildings by dealer firms for use as showrooms and service stations. The total projects in February exceeded 200, as was the case during January, the first two months of the year now in excess of 400 such projects, a big increase over the corresponding months of last year, when one of the best records in the history of the industry was established. This information is based on detailed compilations of industrial construction by a well-known financing concern.

India Tire Raises Common Dividends

AKRON, March 26—Directors of the India Tire & Rubber Co. have placed the common stock of the company on a regular 8 per cent annual basis, instead of the former 4 per cent rate, declaring a quarterly dividend of $2 on the common. The common stock disbursement last quarter was $1, with an extra dividend of $1. It was explained at that time that the stock would not be placed on a regular 8 per cent basis, unless earnings assured the maintenance of this rate for some time.

The usual preferred stock dividend of $1.75 was declared. Both dividends are payable April 1, to stockholders of record March 20, it is announced by Paul C. Searles, secretary and treasurer of the company.

NEW SPACE FOR SEAMAN BODY

MILWAUKEE, March 23—With the letting of all construction contracts the Seaman Body Corp., Milwaukee, affiliated with the Nash Motors Co., has put under way actual work of erecting an addition doubling the present floor space of five stories, 100 by 400 ft. The new facilities will require 1500 additional employees for capacity production, or a total of 4000. The Seaman factory makes inclosed bodies exclusively and practically its entire output is absorbed by the Nash company's Kenosha and Milwaukee factories. In addition, the new Ajax Motors Co. of Racine, also a Nash interest, has just contracted for 20,000 inclosed bodies.

SWINEHART REPORTS GOOD YEAR

AKRON, March 24—Sales of the Swinehart Tire & Rubber Co. for 1924 were approximately $2,600,000, compared with $2,000,000 the previous year, it is announced by President T. F. Walsh. Net earnings of about $100,000 were reported.

"This was the biggest year the company ever had," Mr. Walsh said, "and this in spite of the big reduction made in tire prices and the big flood of last year, in which we lost $30,000 and were compelled to close down the plant for several weeks."

NO OIL INVESTIGATION

WASHINGTON, March 26 — Senator Trammell of Florida failed to obtain a vote in the Senate on his resolution introduced March 12 calling for a general investigation of the oil industry although he pressed for it up to the last moment and was appealing for action when special session adjourned sine die.

METAL MARKETS

Whenever the steel market strikes a slightly rocky road, such as the one it is now traveling, it falls back for an explanation of the jolts on two suppositions. The first of these is that the industry's producing capacity is too large. There is a constant realignment of the relative consumption of the various steel products. A few years ago the capacity of sheet rolling mills was lamentably short of the demand for full-finished sheets from which condition the automotive industries suffered most. The hitch was in the pickling and finishing departments. Today this shortage of facilities has been remedied, and, as a result, full-finished automobile sheets are selling today at below the parity of other steel products, the 4.60c. base price having become merely a convenient level under which to cut when specifications are attractive.

Periodically, however, there occur spurts taxing the capacity to the limit and, while these periods may not last long enough to please producers, equipment has a way to adapt itself to peak demand and not to low-ebb consumption. The second thought that crops up invariably when the market is in the doldrums, is that when buyers drive prices lower, the only feasible way of bringing costs into line is to reduce wages. In the sheet-rolling branch of the industry this is done automatically in a large number of plants through the flexible wage scale, which is based on the selling price of sheets. This adjustment, however, does not touch all of the operatives and, reaching down to the raw materials of steel, iron, scrap, fuel, etc., the problem is one of lowering the per day wage of labor. A western producer has tackled this unpleasant task, and the coke producers were simply driven to do it by the flat refusal of consumers to pay the coke prices asked.

It remains to be seen, however, whether the steel industry is now in position to tackle a job that it has always postponed in the last five years, that of demobilizing wage scales so that prices may be kept reasonably low and still yield a profit. It looks very much as though the issue would again be straddled, although possibly the let-up in structural steel consumption through labor troubles in the building trades may exert considerable influence. Certain it is that labor disturbances will play more of a role in the market from now on than they have in the last five years.

Pig Iron—Automotive foundries are fairly well covered until the middle of summer, and the $21, Valley, base price seems to have the effect that those who need iron for May or June melting can see no reason why they should be in a hurry to anticipate their wants.

Aluminum — Routing conditions prevail with buying restricted through the lightness of offerings. Automotive parts and accessory manufacturers are buying much secondary metal, but here, too, the supply is very light.

Copper—At recessions there is fair absorption of the red metal for both domestic consumption and export. Connecticut valley mills have good orders for automotive brasses.

Calendar

SHOWS

April 1-17—Sydney, Australia, Royal Agricultural Show. Embraces automobile exhibits.

April 8-14—Bandoeng, Batavia, automobile show under auspices of Netherlands Indies Jaebeurs Fair Association.

April 22-May 7 — Melbourne, Australia, International Automobile Show, under the auspices of the Chamber of Automotive Industries, in conjunction with the Royal Automobile Club of Victoria.

May 20-23—Detroit, Second Annual Automotive Maintenance Equipment Show, General Motors Building, conducted by the National Automobile Chamber of Commerce, with cooperation of the Motor and Accessory Manufacturers Association, National Automobile Dealers Association, Society of Automotive Engineers, Automotive Equipment Association, Automotive Electric Association and the Automotive Manufacturers Association, Sam Miles, manager.

Sept. 21-26—London, England, Annual Cycle and Motorcycle. Show under auspices of the British Cycle and Motorcycle Manufacturers and Traders Union, Ltd.

Oct. 8-17 — London, Olympia passenger car show.

Oct. 29-Nov. 7—London, annual truck show.

RACES

April 30—Fresno, Cal.

May 11—Charlotte, N. C.

May 30—Indianapolis.

June 13—Altoona, Pa.

June 20—Baltimore, Washington Speedway, Laurel, Md.

July 26—Paris, Montlhery Track, French Grand Prix.

Sept. 7—Altoona, Pa.

Sept. 30—Fresno, Cal.

Oct. 10—Baltimore-Washington Speedway, Laurel, Md.

Oct. 24—Charlotte, N. C.

Nov. 26—Los Angeles.

CONVENTIONS

May 6-9—Ninth annual meeting of the American Gear Manufacturers Association at William Penn Hotel, Pittsburgh.

May 20-23—Detroit, General Motors Building, National Automotive Service Convention conducted by the National Automobile Chamber of Commerce with the cooperation of Motor and Accessory Manufacturers Association, National Automobile Dealers Association, Society of Automotive Engineers, Automotive Equipment Association, Automotive Electric Association and Automotive Manufacturers Association.

June 22-27—Summer convention of the Automotive Equipment Association at the Broadmoor Hotel, Colorado Springs, Colo.

S. A. E. MEETINGS

National

April 29-30—Tractor meeting in Chicago.

June 15-19 — Summer meeting of the Society of Automotive Engineers at White Sulphur Springs, W. Va.

Sept. 15-16—Production meeting and exhibition.

Sept.—Automotive Transportation meeting.

Nov. — Service Engineering meeting.

Sectional

March 26—Minneapolis Section, Automotive Rail Car Engineering, S. E. Brennan and various railroad men of the twin cities.

March 26—San Francisco Group, Effects of Engine Operation in Lubricating Oils, L. Wagner.

March 27—Los Angeles Group, Air Cleaners, Prof. A. H Hoffman.

April 7—Buffalo Section, Transportation meeting.

April 9—Indiana Section, J. H. Hunt, Electrical Instruments for Automotive Research.

June 15-19—Summer meeting of the Society of Automotive Engineers at White Sulphur Springs, W. Va.

Holt Report Shows Inventories Less

SAN FRANCISCO, March 24—The Holt Manufacturing Company, builders of Holt tractors, which recently was purchased by the interests which control the C. L. Best Tractor Company, of San Leandro and this city, shows a considerable decrease in assets in its annual report, dated Dec. 31, 1924. This report shows a drop of $1,727,860 in assets in 1924 as compared with 1923, showing total assets of $15,781,583 for 1924 as compared with $17,509,444 in 1923.

The decrease is accounted for by a decline in inventories, which account was $7,044,822 in 1923, and $5,623,119 last year. Warrants and accounts of the United States government, states, counties and municipalities, fell from $1,107,359 in 1923 to $586,905 in 1924. The company increased its outstanding capitalization by issuing a million dollars of common stock and raising the total capitalization from $3,333,300 in 1923, to $4,166,600 in 1924. It also decreased its first preferred stock from $1,833,300 in 1923 to $1,666,600 in 1924. Notes payable dropped from $4,865,000 in 1923, to $3,255,000 in 1924, and the surplus decreased from $5,299,795 in 1923, to $4,498,700 in 1924. Reserve showed a slight increase.

DE PALMA WINS AT TANFORAN

SAN FRANCISCO, March 25—Ralph de Palma in a Miller Special won a ten-mile race March 22 at the dirt track at Tanforan held by the Pacific Auto Racing Association of San Bruno. Frank Lockhart was second, also in a Miller Special, and Eddie Hearne was third, driving a Hearne Special. The time was slow, eight minutes twenty-two seconds, due to the poor condition of the track, on which many of the drivers refused to race. William Reid of Los Angeles and Ralph Johnson of Philadelphia had been killed on previous days, and four were injured Sunday—Mike Moosie, San Francisco; Harold Hall, San Jose; Leigh Green, Los Angeles, and Henry Beal, Los Angeles.

SEE BIG COMMERCIAL CAR MARKET IN 1925

PHILADELPHIA, March 24—A survey recently completed by the Commercial Car Journal, published by the Chilton Company of Philadelphia, estimates that the 1925 commercial car market will amount to approximately $1,218,000,000.

This total was divided as follows:

Commercial cars (new, 1924).....	$284,000,000
Tires for replacement	200,000,000
Gasoline	300,000,000
Oils and greases....	48,000,000
Special bodies.....	75,000,000
Replacements and supplies	99,000,000
Special equipment—(Hoists, winches, cranes, etc.).....	22,000,000
Labor (repairing and overhauling)	190,000,000
Total	$1,218,000,000

BID FOR UNITED CO. PLANT

CHICAGO, March 25—R. J. Beatty has offered $50,000 for the plant and other physical assets of the United Manufacturing & Distributing Co., automotive equipment manufacturers.

Jordan Sees Shortage of Cars During April

CLEVELAND, March 24—E. S. Jordan, president of the Jordan Motor Co., says there will be a shortage of cars during the 45 days following April 1. The conditions this year, according to his prediction, will be a complete reversal of the situation that prevailed a year ago.

Experiences of the year 1924, he believes, coupled with the policy of General Motors, Jordan and other manufacturers, in keeping production of cars within the demand and in not forcing cars on dealers have kept stocks in the hands of dealers at a low figure. Dealers who purchased heavily a year ago in anticipation of a great demand for cars with the advent of warm weather in April have not as many on hand this year.

Everyone has been so conservative, says Mr. Jordan, and with business opening up as it is in other lines, there is certain to be a demand for cars that will exceed anticipations of a few months ago. This means a shortage of cars for spring delivery.

JAMES FORTESQUE DIES

BOSTON, March 23—James Fortesque, for more than twenty years identified with motor activities in this city, was buried today. He was killed Thursday evening by a street car.

In the early days of the Bay State Automobile Association he was one of its active officers and was for some years secretary of the Massachusetts Automobile Association. He was the founder of the Metropolitan Automobile Club. As representative of the American Automobile Association he founded many of the motor clubs of New England.